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AN ECONOMIC ANALYSIS OF GOVERNMENTAL EXCHANGE

A Dissertation

Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
requirements for the degree of
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in

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by

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ABSTRACT

The study was designed to analyze state trading in an attempt to determine its economic and non-economic nature and content; to examine those instances in which the comparative cost doctrine lacked the necessary ingredients to explain exchange; and to explore the applicability of game theory to the possible indeterminant regions of bilateral monopoly.

In accomplishing these tasks, the background and types of state trading were first explored. The periods examined ranged from the early Middle Ages to today's present epoch. At this point the general objectives and consequences of state trading were examined. Included were such objectives as domestic protection, disposal of surplus commodities, and price discrimination. The consequences, however, were limited to production and/or consumption effects and factor movements.

Next, the study explored the applicability of international trade theory to the cited situations. Theorists for decades have modified and added to the original forms of comparative advantage or cost doctrine hoping to find the "one" theory to explain exchange among nations. However in their search, various hypotheses were developed

to justify trade under different situations. Hence, it was necessary to identify that "interpretation" which best described the various cases of state trading.

As a consequence of the above "interpretation," it became apparent that in many situations state trading could not be rationalized by the comparative cost doctrine.

Rather, through the use of "offer curves," a zone of indeterminacy was revealed wherein bargaining strengths and tactics determined the outcome. To explain exchange under such conditions, game theory was used.

As a result of the inquiry, several seldom-stressed matters with regard to state trading were revealed. First, the investigation suggested that government exchange is subject to somewhat of a fluctuating pattern. Secondly, the theory of comparative cost was found to be insufficient when applied to many state trading cases. Thirdly, it was shown to be analytically possible (as seen in two analyzed cases--wheat and oil) to apply various game theory models to the state trading phenomenon and glean important insights in the process.

CHAPTER I

INTRODUCTION

Statement of the Problem

The passage of the Trade Expansion Act in 1962 represented a bold American initiative looking toward a new era of expanding trade and economic cohesiveness among the nations of the free world. Today the exuberant hope for building a Grand Design of unity has been chilled by a gradual resurgence of economic and political nationalism. The free world community now stands at a crossroad. It may move forward to a more open international economy--with all free nations enjoying the fruits of closer economic ties--or it could move backward to a world marked by narrow and destructive economic nationalism.¹

From the above passage by the Joint Economic Committee, one may conclude that in the mid sixties the world was indeed at a crossroad. Since that time, the international economy has see-sawed toward greater freedom in some respects, and toward more restraints in others. It is possible, for example, to argue that the rise of state trading has operated to divide the world during the 1960's and 1970's while simultaneously the movement toward economic

¹United States Congress, Joint Economic Committee, Off Dead Center: Some Proposals to Strengthen Free World Economic Cooperation, Report of the Joint Economic Committee, 89th Congress, 1st Session, December, 1965, (Washington, D.C.: Government Printing Office), p. 1.

integration has been further advanced. This study is aimed primarily at the first phenomenon--state trading.

Loosely speaking, state trading occurs when governments or their representatives engage in international trade on government account.² It may be found in many forms such as commodity agreements, offshore procurements, or in the activities of government corporations or other government middleman agencies. In many instances the ultimate motivating force for exchange of commodities may not even be strictly economic.³ When this is so, the traditional tools of economic analysis (emphasizing comparative costs as the basis for exchange) tend to break down into the indeterminate world of bilateral monopoly. As so aptly stated by Jacob Viner:

When governments are also conductors of economic enterprise in the international field, what results is a pattern or intergovernmental relationship in which economic, political, and military bilateral-monopoly plus duopoly are all wrapped up in one package of international dynamite.⁴

²As will be presented later, a more detailed explanation will indicate that state trading exists when national governments or their agents take part in international commerce for varied objectives and under varied conditions and forms to secure imports or sell exports the title which lies with the government or is secured by the government.

³For example, it may be military or political.

⁴Jacob Viner, "International Relations Between State-Controlled National Economics," American Economic Review, XXXIV (March, 1944), 317.

Of course, many government or state trading activities are not covered entirely by the Viner description. There are numerous cases in which governments do conform to the motivating forces (basically profit subject to various constraints) found within private international trade. However, there are enough exceptions to warrant investigation into those cases not fully explained by traditional theory.

Purpose and Nature of Study

It is the purpose of this study to analyze state trading in an attempt to determine its economic (and non-economic) nature and content, to examine those instances in which the comparative costs doctrine lacks the necessary ingredients to explain exchange, and to explore the applicability of game theory to the state trading situation. It is a study that needs to be made, for state trading appears to be growing in relative importance, leaving less and less to be explained by the "traditional" theory of comparative costs, which is most applicable to international exchange through free markets. To date, very little has been done to really get at the nature of the process (it is both economic and political). There have been few systematic attempts to apply traditional economic theory to the state trading case, and no one has apparently attempted to employ game theory (or game-theory-based

bargaining models) to state trading as yet. This last in particular appears to be a rather peculiar oversight, for game theory was developed precisely in order to sharpen the decision-making process under conflict conditions.

To begin to accomplish these tasks, the background and types of state trading are first explored. For purposes of comparison, a brief historical sketch is presented in which "contemporary" governmental trading methods are contrasted with older forms of state trading. Rather than examine minute details, this section will be limited to a broad view in order to emphasize certain fluctuating patterns found within government commerce. Also included in this section is an analysis of the development of the non-market system which has become of critical importance today.

The general objectives and consequences of state trading are examined next. Obviously, state trading can have some far-reaching effects (both political and economic) resulting from government attempts to secure certain state trading goals. Such goals may include: domestic protection, disposal of surplus commodities, securing of strategic materials, political assistance or warfare, and possible price discrimination. Quite obviously, not all of the possible direct and indirect economic impacts can be explored, so this section centers on the most visible or

apparent production and/or consumption effects and factor movements.

Naturally, the impact of state trading depends very much on the particular type of state trading that is being practiced, and this is considered next. At one point in time a government may be an exporter of goods and at another an importer. In each situation the state trader may attempt (depending on its objectives) to sell or buy commodities at the market price, above the market price, or below the market price. Hence, depending on market conditions (and other factors), the government trader may practice price discrimination.

At this point the study explores the applicability of international trade theory to the presented cases. Theorists for decades have modified and added to the original forms of comparative advantage or costs doctrine hoping to find the "one" theory to explain exchange among nations. However, in their search, various hypotheses were developed to justify trade under different assumptions and in different situations. Hence, it is necessary to find that (if any) interpretation which best describes the various cases of state trading. Moreover, the actual question of the applicability of comparative costs is investigated in some depth.

As a result of the above, it becomes apparent that in some cases the doctrine of comparative costs does not

apply to state trading. Instead, the use of "offer curves" indicates that there exists an indeterminate region of trade--a zone where bargaining strength and tactics determine the outcome.

Hence, game theory, an approach uniquely suited to bargaining, is explored as a possible device for explaining state trading actions--especially those of a bilateral monopoly nature. At first a matrix is developed and then modified to show the need for power relationships. At this point, that "power" model (basically Zeuthen, Nash, and others), which is felt to be most capable of application to state trading, is modified and applied to the presented data.

As a final task, two real world state trading cases are examined in some detail. First the controversial American-Soviet wheat deal is analyzed in terms of the reasons for its origination and from the position of its costs and benefits. In addition, the presented game theory is used to reveal (from a rather unique view) the actions of the participants. Secondly, the OPEC (Organization of Petroleum Exporting Countries) is examined; and as with the wheat deal, game theory is used to more fully disclose the activities of the "players."

As to the question of a theory to explain state trading, this paper makes several implicit hypotheses. First, in many instances state trading does not conform to

the comparative cost doctrine. Secondly, state traders do not necessarily exchange goods and services for profit only. Thirdly, there does not exist "a" theory of state trading. Game theory, although used extensively is not in itself a theory of government exchange. Rather it is a device or tool heretofore not used in the examination of state trading. From its use, particular insights are possible--insights not readily found when "attempting" to use traditional theory to explain the trading process.

In conclusion, this dissertation attempts to explore certain economic and non-economic aspects of state trading; it analyzes the lack of applicability of comparative cost doctrine to governmental trade; and as an alternative view examines the possibility of using game theory as a means of explaining or rationalizing prices, directions, and patterns of exchange. This study is viewed as very timely and significant as a result of the recent thaws in U. S. relations with Red China and the Soviet Union--and because of the oil shortage "crisis" in the United States (and the world) much of which finds its origin in the power tactics of the OPEC nations.

CHAPTER II

PAST AND PRESENT STATE TRADING

In order to fully comprehend the nature and problems of state trading, a general knowledge of its evolution and current forms is necessary. This chapter presents a brief historical perspective of state trading from its Middle Ages origin to its present day status. Rather than examine minute details, certain cyclical patterns found within the history of government commerce will be presented. Five chronological time periods are utilized: (1) the early gestation period of the late Middle Ages, (2) the Mercantile period, (3) the Classical era, (4) the early twentieth century, and (5) the modern present-day epoch. The chapter concludes with analysis (post hoc) of state trading.¹

The Early Period

From the earliest records of international commerce, government involvement in the exchange of goods and services has ranged from sporadic and piecemeal to complete domination of trade. State trading appears to have been only one

¹As may be pointed out, not all historians agree to the exact starting point of state trading. Quite obviously, limited forms existed before the Middle Ages. Additionally, events in history (economic) are examined along with various views on the history of economic thought.

facet in the spectrum of control, but a significant one whose origin dates back to the Middle Ages.² During this period, "international" trade was common simply because there were so many "national" borders that had to be crossed in shipping goods even short distances. "State trading" occurred (depending on how liberal an interpretation is given to the term), naturally, as the lords of the many independent manors took part in buying and selling commodities to other similar lords and their entities.³ The city-states of Italy were the most notable cases in point. However, since economic self-sufficiency was the rule rather than the exception, this crude form of state trading was necessarily quite limited.

As time passed, state trading began to take on new dimensions. Gradually, the economic and political organizations that characterized near self-sufficiency weakened with the beginnings of new town urbanization, religious "liberation," and the colonization of newly discovered lands. The "new" states taxed, designated regions of trade, and eventually established trading monopolies.⁴ It was during this era of the emergence of the national state that

²John N. Hazard, "State Trading in History and Theory," Law and Contemporary Problems, XXVI (Summer, 1959), 243-45.

³By state trading, the author is implying that the manor lords were the "governments" of the many small entities.

⁴Hazard, loc. cit.

most economic historians felt the gestation period for state trading was completed. In essence, those elements needed for government commerce (or any form of trade) had been established. Population density had increased; town urbanization had occurred; population quality had begun a slow upward grading with the assistance of the printing press; and beginnings of technological change were present. These elements combined with growing power within many national governments allowed for the firm establishment of exchange between nations on government account.⁵

The Mercantile Period

From the sixteenth to the eighteenth centuries, state trading appeared in form and structure similar to that of the twentieth century. That is, national economic and political power was the keynote of this era of Mercantilism--a fact of supreme importance to government trading activities.

Mercantilism varied from nation to nation and from time to time, but its common theme was the importance of the state in political and economic affairs. Most Mercantilists stressed regulation of activities to further the goals of increased wealth and power. In many instances

⁵For an interesting sociological approach emphasizing these ingredients see: Werner J. Cahnman, "Toennies and Social Change," Social Forces, XL (December, 1968), 136-144.

precious metals were valued and used as measuring rods to gauge the "successfulness" of nations--with state trading, through a strong central government, becoming a significant weapon in the struggle for a favorable balance of trade and the resulting inflow of bullion. The Mercantilist writer Thomas Mun, commenting on the value of trade, put it this way:

Although a kingdom may be enriched by gifts received, or by purchase taken from some other nation, yet these things are uncertain and of small consideration when they happen. The ordinary means therefore to increase our wealth and treasure is by Foreign Trade, wherein we must ever observe this rule; to sell more to strangers yearly than we consume of theirs in value.⁶

As an instrument used to secure such ends, state trading took several forms. For example, trading monopolies were created by special grants from the Crown, companies like the Hudson Bay and East India Companies being cases in point. These organizations were actually "agents" of their respective governments whose task was to explore the new world for the benefit of their mother countries. Although not the government monopoly buyers and sellers of later periods, they were granted exclusive licenses as merchants of the Crown and thus constituted one of the first "true" forms of state trading.⁷

⁶Philip C. Newman, Arthur D. Gayer, and Milton Spencer, eds., Source Readings in Economic Thought (New York: Norton and Company, 1954), pp. 22-25.

⁷There may be some disagreement as to whether these

Similarly (but usually overlooked by economic historians), the securing of bullion was itself an expression of state trading. Noted earlier, it was a goal of many nations to secure gold through a favorable balance of trade. In order to achieve this objective, government intervention took place in an attempt to create those conditions necessary for the inflow of bullion. Hence gold, not usually viewed as a commodity in international exchange, became a significant "good" exchanged between European governments.⁸

In the years that followed, significant changes occurred. Scholars began to argue that international trade could be of mutual advantage to nations engaged in exchange. Bullionist doctrines lost some of their appeal in light of new "liberal" thinking. In many instances, economic and political power was still viewed as a legitimate objective for governments, but even at its height, the influence of Mercantilism was not universal. For example, Pre-Classical writers such as Sir Dudley North and David Hume viewed wealth in a context void of the desirability of gold per se.⁹ Moreover, if the automatic specie-flow mechanism were

companies were "state trading." However, as they were agents of their respective governments involved in some degree of international trade, it can be argued that they were indeed practicing a form of government commerce.

⁸Edward Ames, "State Operations in Gold and Foreign Exchange," Law and Contemporary Problems, XXVI (Summer, 1959), 329-332.

⁹Newman, Gayer, and Spencer, op. cit., p. 53.

permitted to function, it was not necessary for nations to place the weight of their policy decisions to securing gold. As a result, the limited forms of state trading began to diminish under the rising tide of economic liberalism sweeping the seventeenth and eighteenth centuries.

The Classical Period

In many respects the liberal doctrines of what later came to be known as the Classical period are the direct anti-thesis of Mercantilists thought and practice. For example, among the new ideas characterizing the period was the notion that governments were to "encourage" the self-interest of individuals. A "hands off" policy of limited regulation and control was deemed more desirable than allowing governments to manipulate international intercourse for its own benefit.¹⁰ The Benthamite philosophy of little conflict between public good and self-interest reduced the "need" for government intervention and helped create a climate in which state trading all but stagnated and disappeared.

The tenor of the Classical period is best captured by Adam Smith:

What is the species of domestic industry which his capital can employ, and of which the produce is likely to be of the greatest value, every individual, it is evident, can, in his local situation, judge

¹⁰Ibid., p. 117.

much better than any statesman or lawgiver can do for him

To give the monopoly of the home market to the produce of domestic industry, in any particular art or manufacture, is in some measure to direct private people in what manner they ought to employ their capitals, and must, in almost all cases, be either a useless or a hurtful regulation. If the produce of domestic can be brought there as cheap as that of foreign industry, the regulation is evidently useless. If it cannot, it must generally be hurtful.¹¹

Ironically, along with creating (or interpreting) the environment for the demise of state trading, the Classical school indirectly laid the foundation for its later rebirth. The laissez-faire orientation of these scholars (and the economic systems themselves) certainly hastened the passing of the Industrial Revolution and the development of many nations. With the Revolution, however, there appeared a myriad of abuses and social ills. These abuses, in turn, produced their own responses--one of which was that of Karl Marx, with his vision of a state-directed economy.

Socialism was from its very beginning a reaction against social and economic discord and inequity. The Classical doctrines, as the Mercantilist philosophies before them, were not universally accepted, even in their own time. Criticism was especially evident against the possible

¹¹Adam Smith, An Inquiry into the Nature and Causes of the Wealth of Nations (New York: Random House, 1937), pp. 423-424.

by-products of industrialization--business crises, child labor, long hours, and unemployment. Socialists both in England and on the Continent expressed through their writings a desire for a new social order in which mankind could solve his problems void of the competitive evils they envisioned in the present system.¹² As products of the Enlightenment, many distrusted authority yet built and described systems in which authority was a requirement. An enlarged role for the state, including state trading, thus became eminently more possible under the new models than within the classical system.

The Twentieth Century

Of the periods in which state trading occurred, the twentieth century has provided the most fertile climate for its growth. However, as with earlier epochs, an "up again, down again" character has again appeared. Governments continued to use state trading as a tool to achieve certain policy objectives which varied with economic and political conditions. World War I amply demonstrated the usefulness of government trade as a means of securing strategic control over various segments of an economy. As pointed out by J. Hazard, former adviser on state trading to the Department of State:

¹²Newman, Gayer, and Spencer, op. cit., pp. 234-35.

Purchasing missions on government account appeared in the great markets of the world. The Czar of Russia bought munitions in the West, the firm of Morgan financed the French Government in its commercial operations in the United States. The retreat from private enterprise was not limited to the continent. The United States thought it necessary to requisition the railways and to form a commercial fleet to be managed by the War Shipping Board. Yet, governments still relied upon the price system to obtain the goods they required. The War Shipping Board waived its right to claim sovereign immunity in the courts. "Business as usual" is said to have expressed not only one's patriotic duty, but also abounding faith in the transitory character of the whole episode.¹³

Similarly, the Russian Revolution of 1917 laid the foundation for a vast system of economic planning in which state trading became a tool of utmost importance. Lenin, not content with traditional methods of exchange and/or protection, turned to state monopolies of foreign trade. In a decree of 1918 he declared:

All foreign trade is nationalized. Contracts for the purchase or sale of all kinds of products (the products of mines, of industry, of agriculture and others) with foreign governments or individual enterprises abroad will be carried out in the name of the Russian Republic by specially empowered organs. Apart from these organs every contract for trade, for purchase or sale abroad is forbidden.¹⁴

In later statements Stalin followed Lenin's position but was apparently unaware of effects other than immediate protection for Soviet industries.

¹³Hazard, op. cit., p. 244.

¹⁴Ibid., p. 246.

Not until the depression of the thirties and the resulting difficulties in trading did it appear to other nations that government trade could again help to secure advantages in world markets. Bulk buying and barter deals then became contagious as international currencies became scarce and trade restrictions grew.¹⁵ Though intended as only a temporary expedient until the depression ended, such procurement methods allowed nations the opportunity to "bargain" for strategic commodities--goods which could not be easily obtained through traditional channels with the limited amount of foreign exchange available.

Unfortunately, as economic conditions improved, crises appeared anew with the growing possibility of armed conflict. Nazi Germany began to rearm in the middle 1930's, and much of its war program depended on international trade. Reminiscent of past Mercantile practices, state trading developed new dimensions under a powerful and dominant German central government.

The Allies were also busy in their attempts to determine the usefulness of government trade. Even before the war, Russia had been negotiating with the United States for the establishment of a trading mission to be located in New York. The Amtorg Trading Corporation, as it was eventually entitled, originally attempted to isolate itself

¹⁵Ibid.

from United States law and control. However, unsuccessful in its task, the agency was of little significance until the war increased in severity. At this point the American government eased its former restrictions stimulating a rapid increase in trade between the two nations.¹⁶

Other allied nations also began to create similar state trading entities. Nor was trade one way in nature, for the United States set up many of its own governmental departments for the "securing" or importation of strategic materials from foreign countries. The United States Commercial Corporation was a prime example of such a procurement agency.¹⁷

As these forms of state trading multiplied and proliferated throughout the world, opposition appeared from various interest groups. Free trade was still a desired objective (from the world point of view and by many private traders) with many supporters in most nations. In face of this opposition, state trading slowly began to diminish after the war without the protection or guise of a "temporary expedient in difficult times."

Recent State Trading Activities

After war and depression memories had faded, most countries attempted to reconstruct their trading relations

¹⁶ Ibid., pp. 247-50.

¹⁷ Ibid.

using more acceptable peacetime methods. With its commitment to the private enterprise market system, the United States pressed for the readoption of private channels of exchange.¹⁸ Favoring "free" trade rather than "controlled," governments of most Western nations agreed to speed up and facilitate the return of the private market system. However, several major representatives of the allied powers, notably Britain and France, continued and in some cases expanded the use of state trading. Britain, a nation dependent upon imports for her survival, negotiated several long term contracts to ensure supplies of essential agricultural commodities. Some of these lasted until 1955. France formed similar state trading entities in its agricultural sector, in raw materials importation, manufactured goods, and military hardware. Between 1948 and 1953, imports on government account increased to approximately 35 per cent of French intra-European imports. Moreover, even as Great Britain began to phase out governmental exchange, France continued and became the primary exponent of state trading in Western Europe.¹⁹

The Soviet Union also continued to expand its form of government trade. By extending its influence into the

¹⁸Of course, such private channels were subject to regulation through tariffs, quotas, and other trading restrictions.

¹⁹Marc Quinn, "State Trading in Western Europe," Law and Contemporary Problems, XXVI (Summer, 1959), 405.

bordering nations of Eastern Europe, Russia created a Soviet trading bloc with the "adoption" of satellite countries. Each newly acquired neighbor eventually changed its trading practices until nearly all exchange came under the control of their respective central governments. Similar in structure to the Russian model of trading corporations, these state trading nations offered and continue to offer a growing and unified core against the private traders of the West.

Other less developed nations, seeing the success of the British, French, and Soviet Bloc examples, began to experiment with versions of state trading. In many cases these nations, lacking foreign exchange, viewed government trade as a desirable means of obtaining needed foreign currencies. If they were especially subject to persistently declining or unstable prices for their exports, they tended to set up governmental agencies to negotiate bilateral trade agreements. Additionally, their search for new markets and more stable trading relationships led many nations to increased trade with China, Russia, and other Sino-Soviet Bloc members.

An example of the undeveloped nations' efforts in this direction may prove instructive. Between 1954 and 1955 Burma negotiated bilateral trade and payments arrangements with Bulgaria, Czechoslovakia, Communist China, Hungary,

Poland, Rumania, East Germany, and the Soviet Union.²⁰

These agreements were made during a period in which Burma's main export (rice) was experiencing severe price declines in world markets. Aggravated by production surpluses and falling foreign exchange earnings, Burma felt that state trading was the solution to its dilemma. However, it did not prove to be successful:

(1) The quality of imports from the Sino-Soviet bloc were poor, and the deliveries slow and irregular; (2) Burma became an involuntary creditor under some of the agreements when she expected to receive credits; and (3) the world rice market improved, making sales in the free market more attractive than deliveries under contracts to the Sino-Soviet bloc countries.²¹

Ironically, during this same period the United States reversed its policy and laid the foundation for the resurgent development of its own special brand of state trading. In 1954 the Agricultural Trade and Development and Assistance Act (referred to as Public Law 480) was enacted. The Act, known as the Food for Peace program today, was originally established for the disposal of agricultural surpluses but has since served broadly as a tool for (1) the encouragement of economic development in poor countries, (2) the expansion of American markets, and

²⁰J. N. Behrman, "State Trading By Undeveloped Countries," Law and Contemporary Problems, XXVI (Summer, 1959), 454-55.

²¹Ibid., p. 457.

(3) as a vehicle of U. S. foreign policy.²² Basically the Act is divided into three sections or titles. Title I exports are sold abroad for foreign currencies or on credit for U. S. dollars. Title II exports are strictly unilateral gifts to those nations requiring assistance because of disasters, poor food supplies, or to promote economic development. Title III allows the Commodity Credit Corporation to sell or "barter" government owned agricultural surpluses for strategic materials and supplies and services required for the overseas operation of U. S. agencies and the Defense Department. Under this program, U. S. firms make arrangements with the CCC to ship agricultural commodities to predetermined destinations and to finance purchase of, or deliver, an equal bundle of commodities that are being purchased by aid recipient nations or by military establishments. Such primary shipments are restricted to areas that will potentially increase commercial sales for the U. S. The receipts (to the government) from these transactions are used to purchase foreign commodities that are not required to be produced domestically according to balance of payment requirements. The contractor receives payment in agricultural goods for

²²Raymond J. Doll, Glen H. Miller, Jr., and Richard D. Rees, International Trade and American Agriculture, Federal Reserve Bank of Kansas City (September, 1970), pp. 20-21.

providing such services. Specifically, such payment may be large as 2½ per cent of the value of the purchased items. In recent years, 1967-69, total shipments worth 1.3 billion dollars, 1.2 billion dollars, and 1 billion dollars respectively have been made under the total program.²³ Tables 1 and 2 present a break down of U. S. agricultural exports under such government sponsored activities.

Under a similar program (but for stockpiling purposes), the Property Management and Disposal Service of the General Service Administration procures and disposes of materials from U. S. stockpile sources. For purchasing, sealed bids are received by this agency and are awarded according to established criteria which is not always "the lowest bid." In other cases the government "barters" surplus stockpiled commodities for those materials in short supply. For example, titanium may be exchanged for copper, a more desired commodity. Also, stockpiled items may be obtained from sources other than the free world if their specifications require it.²⁴

²³Of course such procurements and sales are subject to the general regulations concerning overseas buying and selling. Furthermore, general approval by Congress is required for the disposition of stockpiled items.

²⁴The above information was secured from the Office of Emergency Procurement. No written confirmation could be obtained as the author was informed that the agencies in question are only under broad guidelines and do not have written instructions as to the specific details of their operations. However, general regulations may be obtained from: Stockpile Report to the Congress, Office of Emergency Preparedness: (January-June, 1970).

TABLE 1
U. S. AGRICULTURAL EXPORTS AND GOVERNMENT FINANCED PROGRAMS
Calendar Years of 1954-69
(Millions of Dollars)
PUBLIC LAW 480

Year	Sales for Foreign Currency	Long-term Dollar and Convertible Foreign Currency Credit Sales	Donations for Disaster Relief and Economic Development	Voluntary Relief Agency Donations	Barter for Strategic Materials	Total Public Law 480
1954 ⁺	--	--	28	20	22	70
1955	263	--	56	186	262	767
1956	638	--	65	187	372	1,262
1957	760	--	39	175	244	1,218
1958	752	--	43	159	65	1,019
1959	731	--	32	111	175	1,049
1960	1,014	--	49	124	117	1,304
1961	878	1	93	151	181	1,304
1962	1,007	42	81	178	137	1,445
1963	1,162	52	99	160	38	1,511
1964	1,232	97	62	186	35	1,612
1965	899	152	73	180	5	1,309
1966	815	239	79	132	41	1,306
1967	736	201	108	179	13	1,237
1968	539	384	101	150	3	1,177
1969	329	409	104	152	--	994

⁺July-December

SOURCE: Foreign Agricultural Trade of the United States, U. S. Department of Agriculture

TABLE 2

U. S. AGRICULTURAL EXPORTS AND GOVERNMENT-FINANCED PROGRAMS
 Calendar Years of 1954-69
 (Millions of Dollars)
 Total Agricultural Exports

Year	Under Specified Government Programs	Outside Specified Government Programs*	All
1954 +	281	1,304	1,585
1955	1,118	2,081	3,199
1956	1,711	2,459	4,170
1957	1,536	2,970	4,506
1958	1,233	2,622	3,855
1959	1,207	2,748	3,955
1960	1,461	3,371	4,832
1961	1,483	3,541	5,024
1962	1,480	3,554	5,034
1963	1,522	4,062	5,584
1964	1,635	4,713	6,384
1965	1,335	4,894	6,229
1966	1,353	5,528	6,881
1967	1,270	5,110	6,380
1968	1,188	5,046	6,234
1969	1,002	4,934	5,936

*"Total agricultural exports outside specified Government programs" include: (1) barter shipments for overseas procurement for U.S. agencies; (2) extension of credit and credit guarantees for relatively short periods; (3) sales of government-owned commodities at less than domestic market prices; and (4) export payments in cash or in kind.

+July-December

Source: Foreign Agricultural Trade of the United States,
 U.S. Department of Agriculture

Since 1967, stockpiling purchases have been small, and emphasis has been toward the disposition of excess materials for currency. Usually a fixed price is established (f. o. b.) for surplus items near or equal to current world market prices of the commodity in question. Table 3 gives a detailed breakdown of strategic materials bought and sold under stockpile directives.

As a last possibility the U. S. has purchased goods and services under its "offshore procurement" programs. Basically, such buying practices are for military aid or assistance. Under the program the selling nation can receive assistance in the development of its overall military capability though higher income or productive capabilities.

Clearly, (as demonstrated by the presented cases) the United States has also become a major participant in state trading.

State Trading in Retrospect

Historically, then, state trading has occurred in many forms and with many variations. At present, the practice is still so diverse that evaluation is an elusive task at best.

Perhaps the most difficult task is to construct a concise explanation of state trading which can encompass all the cases mentioned earlier. Governmental trade has taken

TABLE 3

TITLE III, PUBLIC LAW 480--VALUE OF BARTER CONTRACTS ENTERED INTO AND STRATEGIC MATERIALS
 DELIVERED OR REIMBURSEMENTS RECEIVED THROUGH DEC. 31, 1969*
 (In millions of dollars)

Type	July 1, 1954 through Dec. 31, 1968		Cumulative through Dec. 31, 1969	
	Contracting (Purchases)	Deliveries (Sales)	Contracting (Purchases)	Deliveries (Sales)
Strategic materials for stockpile:				
Strategic stockpile	151.5	151.5	151.5	151.5
Supplemental stockpile	1,420.0	1,426.7	1,420.0	1,426.8
Total	1,571.5	1,578.2	1,571.5	1,578.3
Procurements for other Government agencies:				
AID	33.5	33.3	33.5	33.3
AEC	4.5	3.2	4.5	3.2
DOD	68.5	67.5	68.5	67.5
Total	106.5	4/104.0	106.5	104.0
Grand total**	1,678.0	1,682.2	1,678.0	1,682.3

*The table shows the value of strategic materials delivered to CCC by contractors and reimbursements to CCC for procurements for U. S. Government agencies.

**Contracting totals do not equal delivery and reimbursements totals because the value of the latter, and of the counterpart agricultural exports, varies from contracting figures because of tolerance, premiums and discounts on materials delivered, and contract defaults, etc.

SOURCE: Foreign Agricultural Trade of the United States, U. S. Department of Agriculture.

and continues to take on many different characteristics, depending upon the country practicing it and on the circumstances when it is employed. At one extreme is the Soviet Union, which is the "pure" case today. Not only is foreign exchange in governmental hands, but everything from production to distribution, both horizontally and vertically, is government owned and controlled. In other nations, the state may limit itself to procurement (as in the United States) and delegate to the private sector the task of producing commodities for exchange. Between these extremes lie those countries (developed or under developed) that use some combination of state production and procurement to satisfy their objectives. Thus any explanation of state trading would have to consider political orientation, types of commodities traded, level of income, and the special features of the internal and external production and distribution system of the country or countries concerned.

Similarly, the exact form or type of trading establishment varies from country to country. In some, the most common form is the public corporation. In others there appears to be a mixture of many forms, including purchase offices, marketing boards, stores departments, supply missions, committees, purchasing authorities, food agencies, and import and/or export offices.²⁵ Moreover, these forms

²⁵United Nations, State Trading in Countries of the

vary in degrees of autonomy in their commercial operations.²⁶ As a result, advantages (or disadvantages) can accrue to public agencies that are not available (without additional costs or perhaps not at all) to private traders. For example, free use of government services may be made available to state trading organizations while private merchants have to go to the market for them.²⁷ On the other hand, without relative autonomy the state trader may be severely limited in its flexibility and its ability to employ commercial principles in its operation. Again, the degree of autonomy will vary from case to case, depending on the goals of the organization, the products it handles, the political philosophy of the country, and so on.

It therefore appears that state trading can take on a nearly infinite variety of forms and characteristics when circumstances create different environments for its existence. How, then, can it be defined? Obviously, the definition must be broad, although much meaning may be lost

Asia and The Far East Region, Report by the ECAFE Secretariat, Economic Commission for Asia and the Far East (New York: United Nations, 1964), pp. 2-3.

²⁶Autonomy is the degree of restraint or freedom in such areas as legal administration, financing, rights and privileges, pricing policies, and objectives to be pursued.

²⁷Public Transportation services and additional credit facilities being cases in point.

in making it so general.²⁸ That, however, appears to be a necessary evil.

For purposes of this study, therefore, "state trading" shall be defined simply as "governmental participation in international commerce as buyer or seller." Objectives may vary, commodities and conditions may vary, but if a government through any of its agencies purchases or sells in international trade for its own account, it may be said to be "state trading."

²⁸This refers to the debate between realistic and unrealistic assumptions in economic theory. Shall the assumptions be realistically accurate and detailed in their description or shall the assumptions be broad and "unrealistic" and hence lead to more universal application. Perhaps Cartter's inbetween approach has merit in that:

"The more specific and descriptively realistic a theory is, the more specialized is its use, carried to the extreme, a theory based on thoroughly realistic and accurate assumptions is applicable to one unique situation in time and space. The wider the desired application of a theory the simpler and more generalized it must be."

See: Cartter, Allan M., Theory of Wages and Employment (Richard Irwin, Inc., 1959), p. 4, and also Friedman, Milton, Essays on Positive Economics.

CHAPTER III

GOALS AND CONSEQUENCES OF STATE TRADING

As noted earlier, state trading can result from a myriad of motivating forces. Depending on circumstances and conditions, nations use governmental trade to secure objectives that are varied and in many instances hidden from view. It is thus the purpose of this chapter to note the various possible goals of state trading and explore some economic consequences of its practice.

General Objectives

It is not easy to analyze the goals of state trading, for they are complex. Most nations do not have a single goal but "mixtures" tied to the overall economic and political aims of their governments. Some of the major objectives which may be sought singularly or in combination include:

- (a) Ensuring regular supplies of commodities at stable or favorable prices. Britain has used "bulk purchase" contracts with Argentina to ensure itself of a regular supply of beef and other staples, for example. (Stability in home consumption standards may be an important overall governmental objective.)
- (b) Maintaining stable production levels at home by means of international commodity agreements which set price ranges and production quotas for each member. Members of the International Coffee

Agreement, for example, have this as one of their several goals.

(c) Securing markets for the disposal of surplus commodities, either through barter or through normal commercial channels. Public law 480 sales and grants of U. S. farm commodities is an example.

(d) Securing special advantages through bulk transactions. Again, Britain's "bulk purchase" contracts are cases in point. One such contract entailed the purchase of New Zealand's entire export surplus of meat for seven years, with prices free to vary only $7\frac{1}{2}$ per cent annually.

(e) Ensuring the supply of strategic or essential materials. U. S. stockpiling purchases of strategic ores are an example.

(f) Maintaining control over foreign economic assistance programs. Aid-receiving countries may have a propensity to expend assistance in the form of hard foreign exchange in wasteful or non-economic ways; this tendency can be controlled by providing assistance in the form of goods exported by the donor government.

(g) Raising revenues. Financially hard-pressed governments may profit by purchasing commodities domestically at relatively low prices and selling them at the world price.

(h) Regulating health and sanitary conditions. A government may take it upon itself to ensure an adequate supply of food or medicine by doing the overseas purchasing itself.

(i) Making more effective use of foreign exchange and/or conserving existing supplies. Straight barter deals make usage of foreign exchange unnecessary; similarly, trade can be directed away from scarce-currency areas toward surplus-currency areas if convertibility problems exist.

(j) Increasing the dependence of other countries upon the state trader for political or economic reasons. The Soviet Union has been quite successful in this respect since World War II, and Hitler's Germany made efforts in this direction during the 1930's.

(k) Increasing the effectiveness of economic planning by enlarging government's role in the economy. Britain's Labor government in the immediate post-World War II period attempted just this strategy.

(l) Facilitating the economic development process. By means of state trading, for example, the state trader may stimulate production in its own industries or industries of other nations.

(m) Improving the terms of trade. By controlling export supplies and buying imports in bloc, a state trading government may be able to increase its gains from trade.

(n) Facilitating trade with centrally planned economies. If a government feels that its private traders would be at a bargaining disadvantage in dealing with a Soviet-type country, it may set up a trading agency¹ of its own to "balance off" the monolithic entity.

The above list, though long, is not necessarily all-inclusive. There may be other objectives not publicly divulged or there may be subclasses of each major goal. Moreover, a more broadly stated goal might include one.

The Economic Consequences of State Trading (Static)

This section considers the economic consequences of various actions on the part of state traders, viewed in a static framework. In all cases, the term "state trader" will refer to the practicing government agency. A nation, regardless of whether its economy is basically market or non-market, employs its "agents" to perform its tasks. For sake of simplicity, such agents will be assumed to be the

¹See: United Nations, State Trading in Countries of the Asia and the Far East Region, report by the ECAFE Secretariat, Economic Commission for Asia and the Far East (New York: United Nations, 1964), pp. 1-3. Also see: Walter Krause, International Economics (Boston: Houghton Mifflin Co., 1965), pp. 197-98, and pp. 206-09.

As the reader may note, these objectives are not necessarily uniform in direction. That is, the pursuit of one may conflict with the obtainment of another. For example, facilitating the development of another nation may entail a sacrifice in the terms of trade of the assisting country.

state trading country's sole international trader--in other words, anything exported from the country is purchased by the agency from those enterprises who do the actual producing and then sold to foreign consumers by the agency, just as it purchases all imports from foreign suppliers and markets them to domestic consumers. Also, it is assumed that there are only two countries in the world--the state trader and its trading partner, which might be labeled "the rest of the world."

The actions considered may be taken in pursuit of one or several of the objectives just outlined and do not relate specifically to any single one.² Two basic cases are examined: that of undertrading, wherein fewer goods are exchanged because of actions by the state trader; and overtrading, where the reverse applies.³

Acting as an Exporter (above previous export prices).--In some situations, the state trader may attempt to limit exports in order to secure one or more of the previously stated objectives. The effect of such an action is similar to that of a tax on exports under a regime of private trade. That is, assume the state agency is

²Of course, as noted earlier, profit does not have to be pursued. Hence, the state trader does not have to seek profits or avoid losses.

³These terms will become apparent as the cases are presented.

initially selling exports at certain prices but then attempts to sell the goods at higher prices by restricting the volume exported.⁴ Foreign purchasers (whether state traders themselves or private merchants) will be confronted with higher prices than before for their imports. Faced with such higher prices, the foreign consumer will in most cases reduce the volume purchased. These higher prices in turn can be expected to stimulate foreign production in overseas import-competing industries, if any. In the state trading nation, however, domestic consumption in the home market may be stimulated with increased local supplies resulting from possible lost overseas markets, especially if home prices drop somewhat. But, lower prices may discourage production of the commodity in question. Figure 1 depicts such a trading situation. The diagrams presented are "back to back" supply and demand charts; one for the exporting state trader's home market and one for the overseas home market.⁵ The price axis is common to both nations and the quantity axis represents the same type of

⁴These initial prices might be called "world" prices since, as will be seen, they are common to both the exporting and importing countries.

⁵Diagrams of these types are found throughout most international trade texts. For example, see: Delbert A. Snider, An Introduction to International Economics (1967), p. 46; or Charles P. Kindleberger, International Economics (1973), p. 94.

good. In Figure 1-A, S and D represent domestic supply and demand in the state trading nation; S and D in Figure 1-B similarly represent supply and demand in the overseas purchasing nation's domestic market. Without any trade (and, therefore, no state trading agency) supply and demand conditions would establish a price of P_1 in the state trading nation, while a P_2 price would prevail in the overseas market. As the state trader enters, total demand in the state trading nation for the commodity in question shifts to D_T creating a price of P_3 . At this P_3 price domestic quantity demanded is equal to P_3B while total domestic production is P_3A . The distance AB represents the demand by the state trading agency for the commodity in question which in turn will be sold overseas. Distance AB thus represents the exports of the state trader. In the foreign country, these available goods from the state trader give rise to a shift in the total supply schedule to S_T , which now includes foreign domestic production (import competing goods) and the supply from the state trader. A P_3 price results with P_3C being domestically produced and CE imported. As may be noted, the distance $CE = AB$ as exports of one nation must equal the imports of the other country. P_3 is now the assumed world selling price and the price in both markets.⁶

⁶The P_3 price is the same price that would prevail

At this point it is possible to illustrate the impact of the state trader limiting exports. P_3 , as just described, is the initial price in both markets when the state trader sells volume AB overseas. Now if the state trader decreases its demand in its own market to D_T' , price drops to P_4 . At this P_4 price domestic consumption is P_4H , an increase over previous consumption of P_3B . However, total production now drops to P_4J , a reduction relative to P_3A . Of course, JH now represents the volume of exports which is clearly smaller than before.

In the overseas market similar production and consumption effects occur. With reduced imports available from the state trader, S_T now is reduced (a leftward shift) to S_T' . With the new reduced supply schedule and the given demand schedule a price of P_5 results. At P_5 , overseas domestic production (in importing competing industries) is P_5K --an increase over the previous P_3C level. Similarly, domestic consumption with the higher P_5 price is now P_5F --a reduction relative to P_3E . Again, imports into the buying overseas market must equal exports from the state trader, or distance JH must equal KF. In sum:

under conditions of free trade without any restrictions, i.e., under conditions of pure competition. In effect, the state trader is initially allowing this condition (price) to exist even though it might be able to enlarge its export earnings at some other price. Economic goals, in other words, may not be its primary goals.

(1) domestic production in the state trading nation is reduced (P_3A to P_4J); (2) domestic consumption in the state trading nation is increased (P_3B to P_4H); (3) overseas consumption is reduced (P_3E to P_5F); and (4) overseas production in import-competing industries is stimulated (P_3C to P_5K). And as noted in the beginning, undertrading occurs as fewer goods are internationally exchanged (originally trade equalled $AB = CE$; now exports are reduced to $JH = KF$).

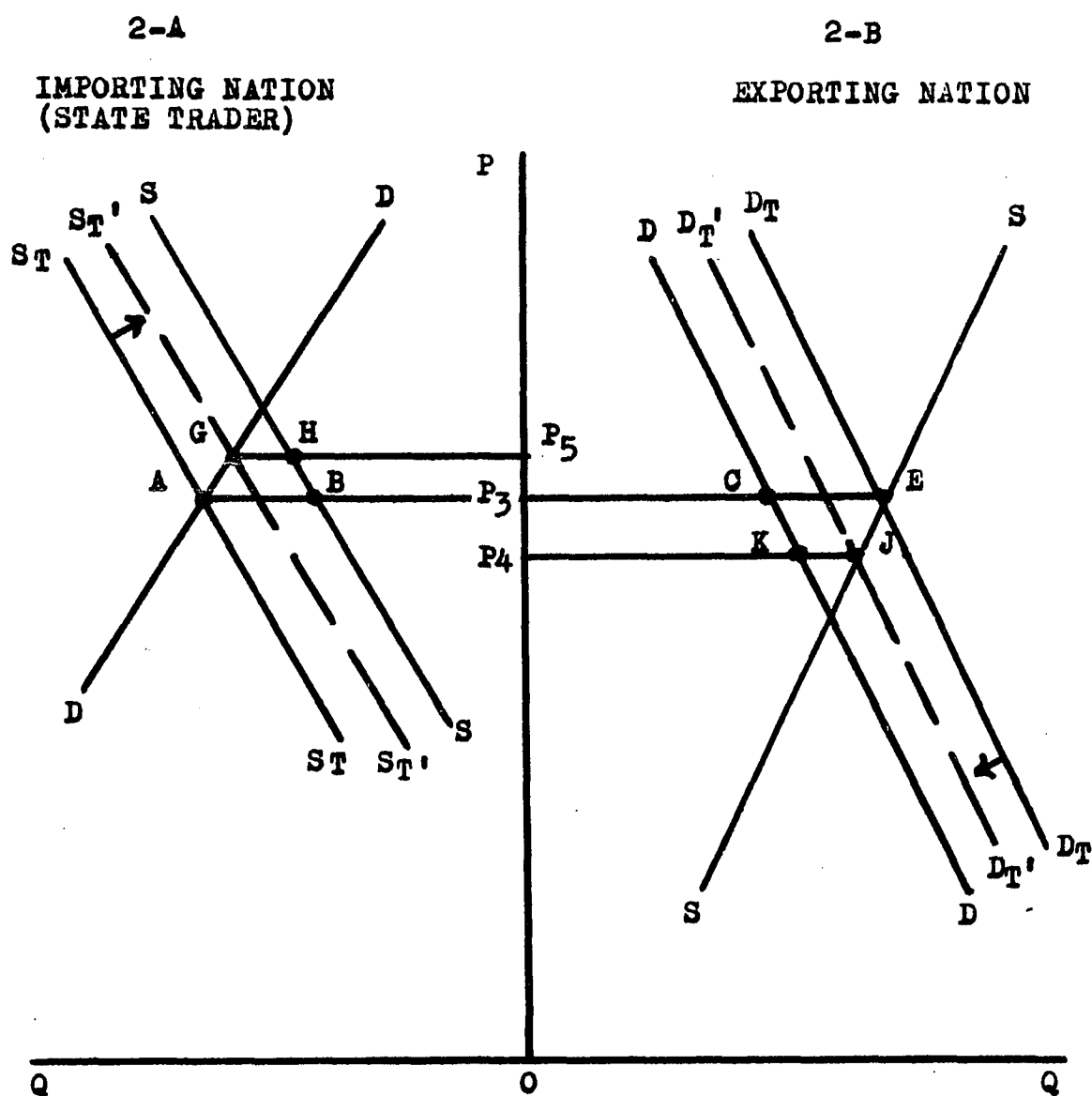
It might be argued, from a welfare point of view, that with higher export prices and restricted quantities the world pattern of resource use is distorted. That is, the state trader underuses resources in its relatively low cost industries. The importing nation, however, tends to expand production in a higher cost production area, using too many world resources in the process. This result can only be avoided, of course, if the state trader limits its undertrading activities, i.e., does not attempt to raise export prices by reducing exports. But then it would be foregoing one of the advantages of engaging in state trading. Almost by definition, then, the state trader subordinates world economic welfare for its own national economic welfare--in a static sense, at least.

Acting as an Importer (below previous import prices).--Under certain conditions it may also appear

desirable for the state trader to attempt to import commodities below previous prices, which will reduce quantities purchased if the foreign supply curve has any elasticity at all. In this case of undertrading the economic results are similar to that of a tariff on imports. The action tends to reduce the price of the commodity in foreign markets by leaving an increased supply abroad. Foreign consumption then tends to increase while foreign production is cut back. Similarly, within the state trading nation domestic consumption may be restricted if prices rise with reduced supplies of the imported good. These price rises likewise may stimulate domestic production in import-competing industries. Figure 2 depicts such a possible case.⁷ Starting this time with the P_3 price (the world price with the state trader already engaged in international commerce) it is possible to illustrate the impacts when the state trader limits or reduces its imports. Initially at the P_3 world price, the state trader is domestically producing P_3B in its own import-competing industries (Figure 2-A). Total consumption, however, at the P_3 price equals P_3A . Distance AB, therefore, equals the volume of imports into the state trader before it attempts to reduce imports. In the overseas selling nation, total production at the P_3 price equals

⁷The supply and demand curves are the same as in the previous case and hence are not re-explained here.

FIGURE 2



STATE TRADER: ACTING AS AN IMPORTER BELOW PREVIOUS IMPORT PRICES

P_3E (Figure 2-B). However, domestic demand at the P_3 price equals P_3C . Distance CE thus equals the exports of this nation and as in the previous case, exports of one nation equal the imports of its trading partner, or distance $CE = AB$. If the state trader now attempts to limit imports by reducing its overseas demand, the exporting nation's total demand D_T shifts leftward to D_T' (Figure 2-B). As a result, prices drop to P_4 . At P_4 , production is reduced to P_4J while consumption (at this lower price) increases to P_4K . Within the state trading country the effect appears as a reduction of total supply from S_T to S_T' (Figure 2-A). Prices rise to P_5 . At the higher P_5 price, consumption is reduced and now appears at P_5G . Additionally, the higher P_5 price stimulates production in the state trading nation's import competing sectors--or graphically to P_5H compared to P_3B previously.

In sum, the expected effects when the state trader reduces its imports are: (1) reduced consumption in the state trading nation (P_3A to P_5G); (2) increased production in the state trader's import competing sector (P_3B to P_5H); (3) reduced production in the overseas exporting nation (P_3E to P_4J); and (4) increased overseas consumption (P_3C to P_4K).

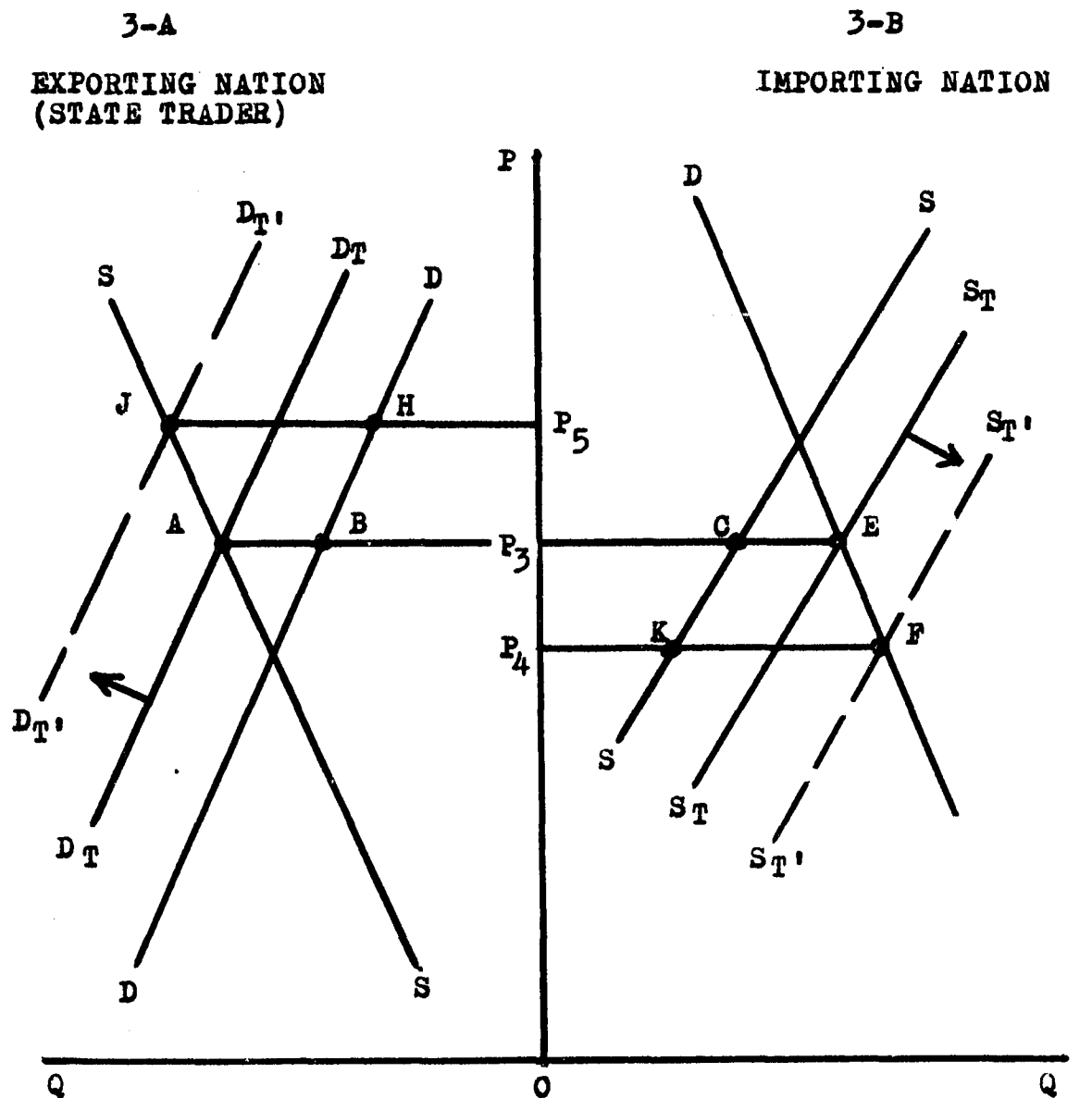
Acting as an Exporter (below previous export prices).--In some situations a state trader may take the

position of an exporter selling commodities below previous export prices. To accomplish this objective of lower export prices, greater supplies are usually made available to the overseas importing nation. In such cases the economic effects are similar to those of subsidies of the state trader's export industries. Overtrading may then result, in contrast to the previously analyzed cases of undertrading.⁸

More specifically, if the state trader sells exports below previous prices by way of greater exports, an increase in foreign consumption should result (assuming foreign demand is not perfectly inelastic). Lower prices abroad would tend to force foreign import-competing industries to restrict production, while domestic production in the state trader's nation would be stimulated by the additional exports. However, domestic consumption in the state trading country would ordinarily be diminished as home prices rise in consequence of the state trader's policies. Figure 3 depicts such a possible trading situation. Again the assumption of an initial P_3 price remains. Given this price, the state trader will export volume AB while its citizens consume volume P_3B (Figure 3-A). Of course, total production at the P_3 price equals P_3A in the

⁸In the cases of overtrading, the state trader is buying at high prices and selling at low prices; obviously, it is pursuing objectives other than revenue.

FIGURE 3



STATE TRADER: ACTING AS AN EXPORTER BELOW PREVIOUS EXPORT PRICES

state trading nation. Overseas in the importing country, given a price of P_3 , total production equals P_3C while total consumption equals P_3E with the distance CE equaling the volume of imports needed to allow total consumption to be P_3E (Figure 3-B). Again, exports equal imports or distance $AB = CE$.

At this point if the state trader begins its increased export policies, it will demand an additional amount from its own domestic markets. This can be likened to a shift from D_T to D_T' --or an increase in demand. As a result, in the state trading nation prices rise to P_5 . At this higher P_5 price, consumption decreases and is now equal to P_5H . Of course with higher prices, local industries increase production until total output equals P_5J --an increase relative to P_3A . Exports are also now larger and equal to distance HJ . Overseas, the state trader's policies are having consumption and production effects but in an opposite direction (Figure 3-B). The additional quantities made available by the state trader have increased the total supply from S_T to S_T' . As a result, price drops to P_4 at which point increased total consumption occurs--or P_4F . However, lower prices in this overseas market will normally curtail the production of import-competing goods. In this case P_4K in domestic production occurs rather than the previously larger amount P_3C . Distance KF now

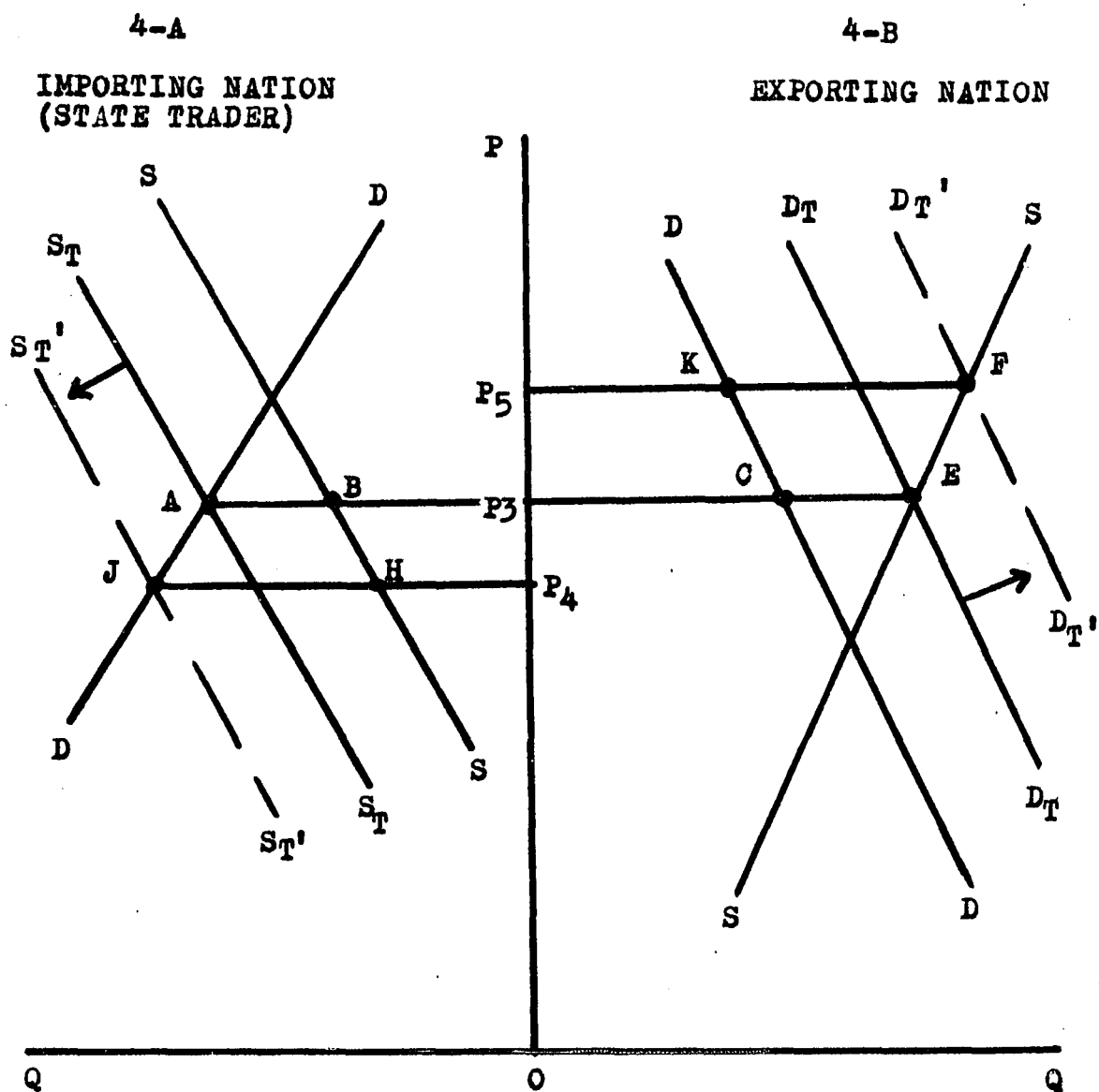
represents the increased imports into this country which are again equal to the larger exports of the state trader-- or $KF = JH$. In sum, if the state trader exports larger volumes than in previous periods the effects will ordinarily be: (1) increased production in the state trading nation (P_3A to P_5J); (2) reduced consumption in the state trader's country (P_3B to P_5H); (3) overseas, increased consumption occurs (P_3E to P_4F); and (4) restricted production in import-competing sectors appears (P_3C to P_4K). In this case, therefore, overtrading is possible as greater volumes are exchanged internationally ($JH = KF$, which is greater than $AB = CE$).

Acting as Importer (above previous prices).--Overtrading can also result if the state trader imports commodities above previous levels. The effect is again similar to that of a subsidy to private traders (the foreign producer in this case) with similar production and consumption changes. Within the buying or importing state trading nation, the additional supplies from abroad (imports) will normally lower prices in its domestic market stimulating increased consumption. However, the state trader's domestic import-competing industries will usually reduce production in light of lower prevailing prices in the market. Overseas, the effect of increased demand for the good in question will normally raise prices in their

markets. Such increased prices will in turn reduce consumption of the commodity if demand is anything but perfectly inelastic. Production, however, in light of the increased demands by the buying state trader will normally expand the subsidy effect to the foreign producer. Graphically, this situation is illustrated by Figure 4. Again the assumptions are the same as in Figures 1-3 and the initial starting price is P_3 . Of course at the P_3 price, exports from the overseas seller equals distance CE. Within the importing state trader's nation these appear as imports or distance AB . . . again imports of one nation equal the exports of its trading partner or distance AB = CE.

With the introduction of the state trader's new purchasing policy, total demand in the overseas market increases to D_T' with resulting production and consumption changes (Figure 4-B). That is, with the increased demand by the state trader and resulting higher overseas prices, foreign production increases with the P_5 price to P_5F --an increase relative to P_3E . However, foreign consumption at the P_5 price is reduced to P_5K rather than the previous larger volume at the P_3 price of P_3C . Clearly, overseas industries increase output while overseas consumers reduce their purchases. The difference between the greater output and reduced overseas consumption now appears as distance KF, or the new larger volume of exports.

FIGURE 4



• STATE TRADER: ACTING AS AN IMPORTER ABOVE PREVIOUS IMPORT PRICES

Turning to the state trading country itself (Figure 4-A), additional purchases from overseas markets appear as increased supplies (additional imports) within the state trader's nation. Diagrammatically, these increased imports cause the total supply schedule to increase from S_T to S_T' . As a result, price drops to P_4 . At the new P_4 price level, total consumption increases to P_4J --an increase relative to price level P_3 and consumption of P_3A . Domestic import-competing industries, however, in light of this lower price reduce their output or production from P_3B to P_4H . Hence, total domestic production has decreased while total consumption has increased. Of course, this is only made possible by the increased volume of imports or distance JH --the difference between domestic output and consumption. In sum, the expected effects in this case are: (1) overseas production is stimulated (P_3E to P_5F); (2) overseas consumption decreased (P_3C to P_5K); (3) within the state trading nation consumption increases (P_3A to P_4J); and (4) the state trader's import-competing industries reduce production (P_3B to P_4H). However, in total more goods are internationally exchanged ($KF = JH$ which is greater than $\angle CE = AB$) or overtrading exists.

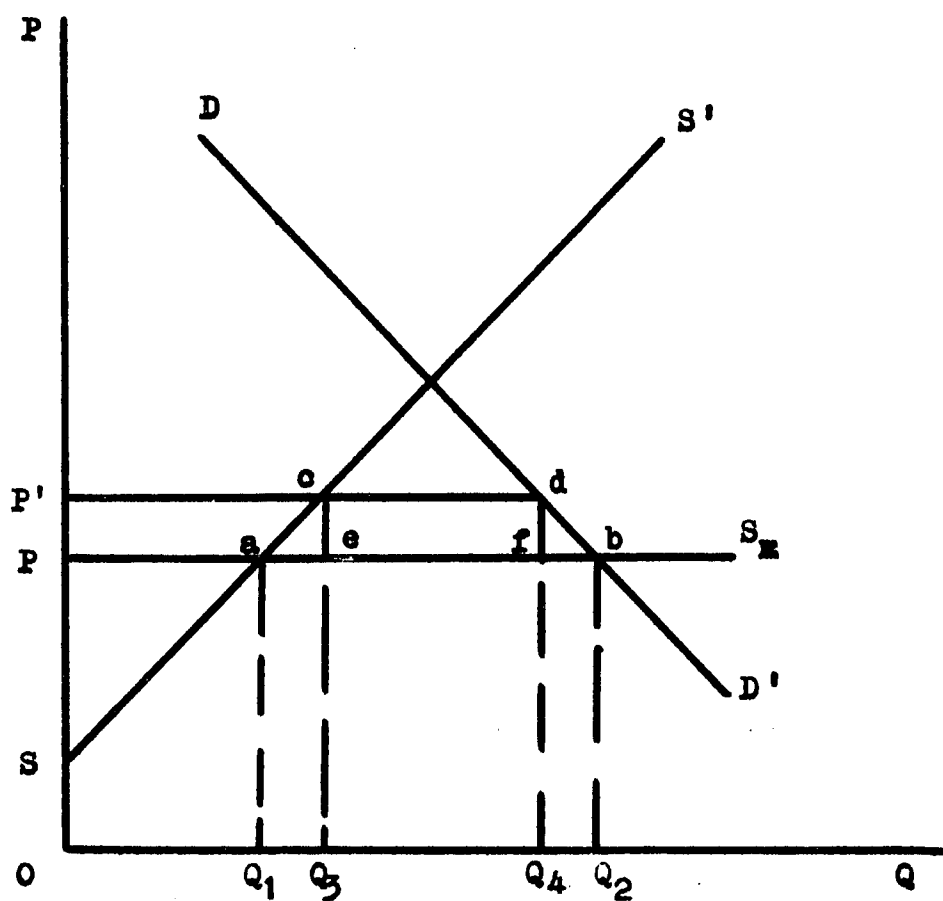
Internal effects.--The preceding sections detail the impact of price changes on volumes traded and summarize the production and consumption effects upon the trading

countries. Perhaps a closer look at the latter will be helpful.

To illustrate, it is possible to further explore a case of undertrading, specifically the variant in which the state trading agency is attempting to force import prices down via reduced purchases. As noted earlier, the domestic impact upon the state trading country is similar to that of a tax or tariff on imports. The expected results would be: (1) reduced domestic consumption as internal prices rise, and (2) increased domestic production of import-competing substitutes. Figure 5 depicts such an undertrading situation. DD' is the state trading country's total demand for the commodity. SS' is the state trading country's domestic supply curve of the good, reflecting its import-competing industry's supply capabilities. PS_m is the supply of importables coming from abroad, funnelled through the state trading agency and sold initially at price P ; this curve is assumed to be perfectly elastic for the sake of simplicity in the diagram, and the amount imported is Q_1Q_2 . Amount OQ_1 is produced domestically and OQ_2 is consumed in total. When the state trading agency cuts imports to, say, Q_3Q_4 because of its attempts to force world prices down, domestic prices are forced up to P' . Total consumption is lowered to OQ_4 while domestic production increased to OQ_3 .

A number of welfare effects follow from this import restriction. First, there is a reduction of consumer's

FIGURE 5

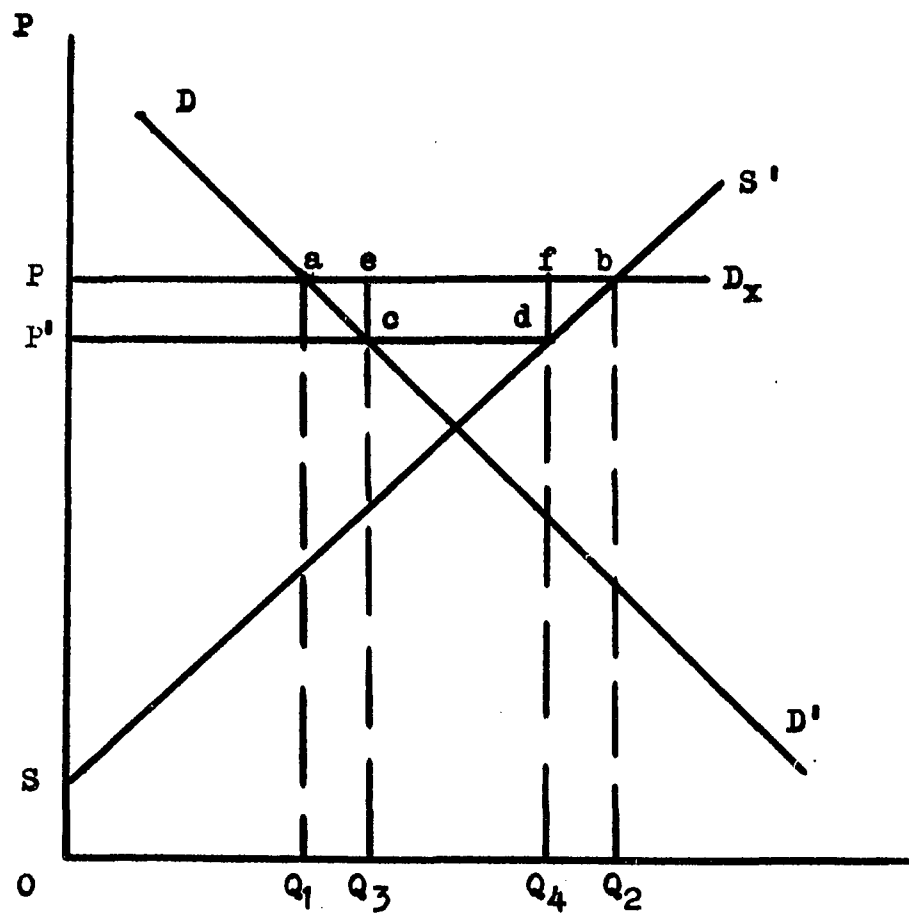


STATE TRADING: UNDERTRADING INTERNAL EFFECTS
WITHIN STATE TRADING COUNTRY

surplus because the commodity price has risen--the reduction graphically is represented by the four-sided area $PbdP'$. Second, there is an increase in producer's surplus from SaP to ScP' , a net gain of $PacP'$. This net gain by producers at the expense of consumers may be called the "redistribution effect" of the state trading action. The area aec represents the "protective effect," the loss of consumer's surplus due to the cost of employing resources in this relatively inefficient industry at the expense of other industries. Area fbd represents the "consumption effect," a welfare loss traceable to the necessity of shifting purchases to other less desired goods. The rectangle $efdc$ represents a "revenue effect" or profit to the state trading agency stemming from its purchases at low prices and sales at higher ones. (Of course, if the world prices fall as it wishes, the area will be still greater.)

Meanwhile, what is transpiring in the exporting country? In Figure 6, DD' is the exporting country's home demand curve for its own exportable good and SS' is its supply curve. PD_x is the state trading country's demand for exportables initially, again assumed perfectly elastic for diagrammatic simplicity. P is the initial price, exports are Q_1Q_2 , total production is OQ_2 , and domestic consumption is OQ_1 . When the state trading agency trims its purchases back to Q_3Q_4 , the price drops to P' in the

FIGURE 6



STATE TRADING: UNDERTRADING INTERNAL EFFECTS
WITHIN THE EXPORTING COUNTRY

exporting country; production falls to OQ_4 while domestic consumption increases to OQ_3 .

The welfare effects, of course, are the reverse of those in the importing country. Producer's surplus is trimmed from SbP to SdP' , a loss of $P'dbP$. Of this, consumers get $P'caP$ as an addition to their consumers' surplus, and this part of the lost producers' surplus is the "redistribution effect." Area $cdfe$ is lost to the state trading agency in the importing country and might be thought of as a negative "revenue effect." Area cea might be called a type of "consumption effect," stemming from the diversion of domestic consumption from other, more preferred goods (under previous price conditions) to the exportable good. Likewise, area dbf might be called a type of "protective effect," reflecting efficiency losses from having to employ factors of production in some "second best" employment due to cuts in the production of exportables.

Similar analyses could be made of the other undertrading case or of either overtrading case, with similar effects. The point of all this is, of course, that actions by a state trading agency to depart from "market" prices distort production and consumption within the trading countries as well as affecting trade volumes, values, terms of trade of both partners, and revenues.

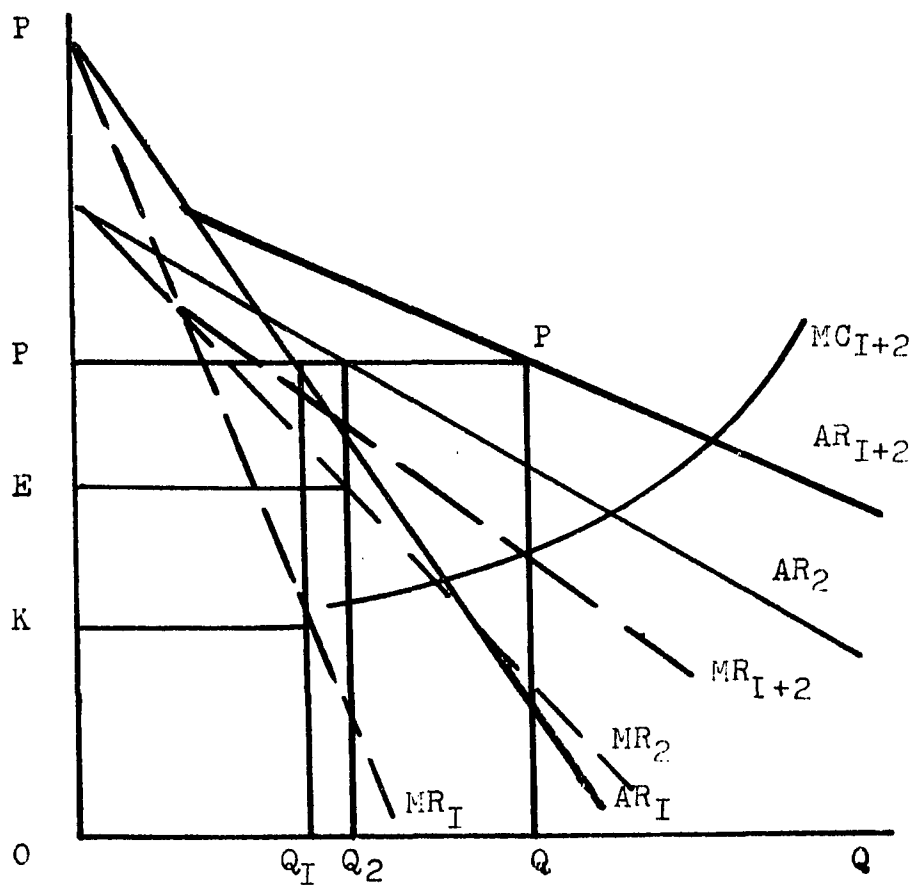
The Determinants of Governmental Pricing Behavior.-

Clearly, the cases just described indicate that the state trader may find it advantageous, depending on its objectives, to distort trade patterns and prices. However, it may also find it desirable to practice price discrimination if more than one market exists for either its purchases or sales. It may arise not only because of a desire for increased monetary profits, but for other non-economic objectives as well.

In its role as seller or exporter, if profit maximization is desired and market demand elasticities vary, the state trader will ordinarily attempt to equate its marginal cost and marginal revenue. Since the marginal cost (of production if the state trader produces or of acquisition if it does not) is assumed to be the same in both markets the problem is one of determining the different marginal revenues. Two approaches may be used, one in which the seller practices no price discrimination but could; and one in which two prices are charged in different markets in order to maximize profit.

In the first case, the state trader may ignore the demand differences in the two markets and simply add together the two demand curves and hence the marginal revenue curves, as in Figure 7. At the point of intersection of the combined marginal revenue curves with the

FIGURE 7



NO PRICE DISCRIMINATION: AGGREGATED DEMAND CURVES
INEQUALITY OF MARGINAL
REVENUE

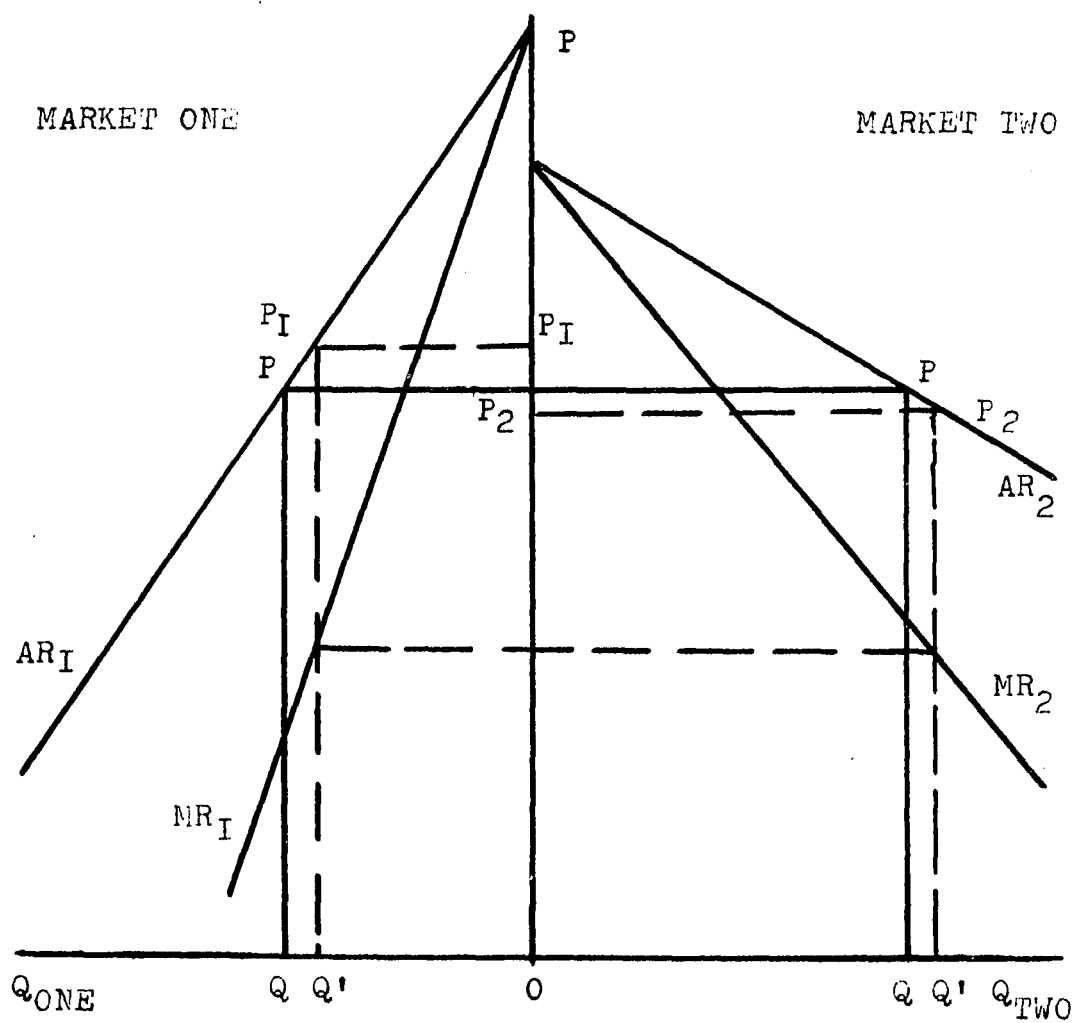
marginal cost curve, profit maximization will occur (given the state trading unwillingness to discriminate). But as Figure 7 shows, higher marginal revenue results in Market Two at the equilibrium level of output. The state trader could benefit by increasing sales in the more elastic market (Number Two).

In Figure 8, however, the state trader is attempting to truly maximize profits and is willing to engage in price discrimination to do so. The two markets have different demand and marginal revenue conditions. With a shift of quantity QQ' to Market Two from Market One, marginal revenues are equated to each other and to marginal cost. This means that profits are maximized by charging a higher price (OP_1) in Market One and a lower price (OP_2) in Market Two. Taking advantage of the different demand elasticities, discriminatory pricing results.⁹

Obviously, then, a state trader may choose to sell abroad at either a higher or lower price than that prevailing at home, depending on demand conditions. And if overseas (or home) markets are sufficiently isolated from each other, further price discrimination could occur.

⁹In this case, profit maximization is assumed. However, non-economic objectives may motivate sales in the opposite direction of that described. See pages 31, 32, and 33 for a list of goals which do not always necessitate maximization of profit or minimization of losses.

FIGURE 8



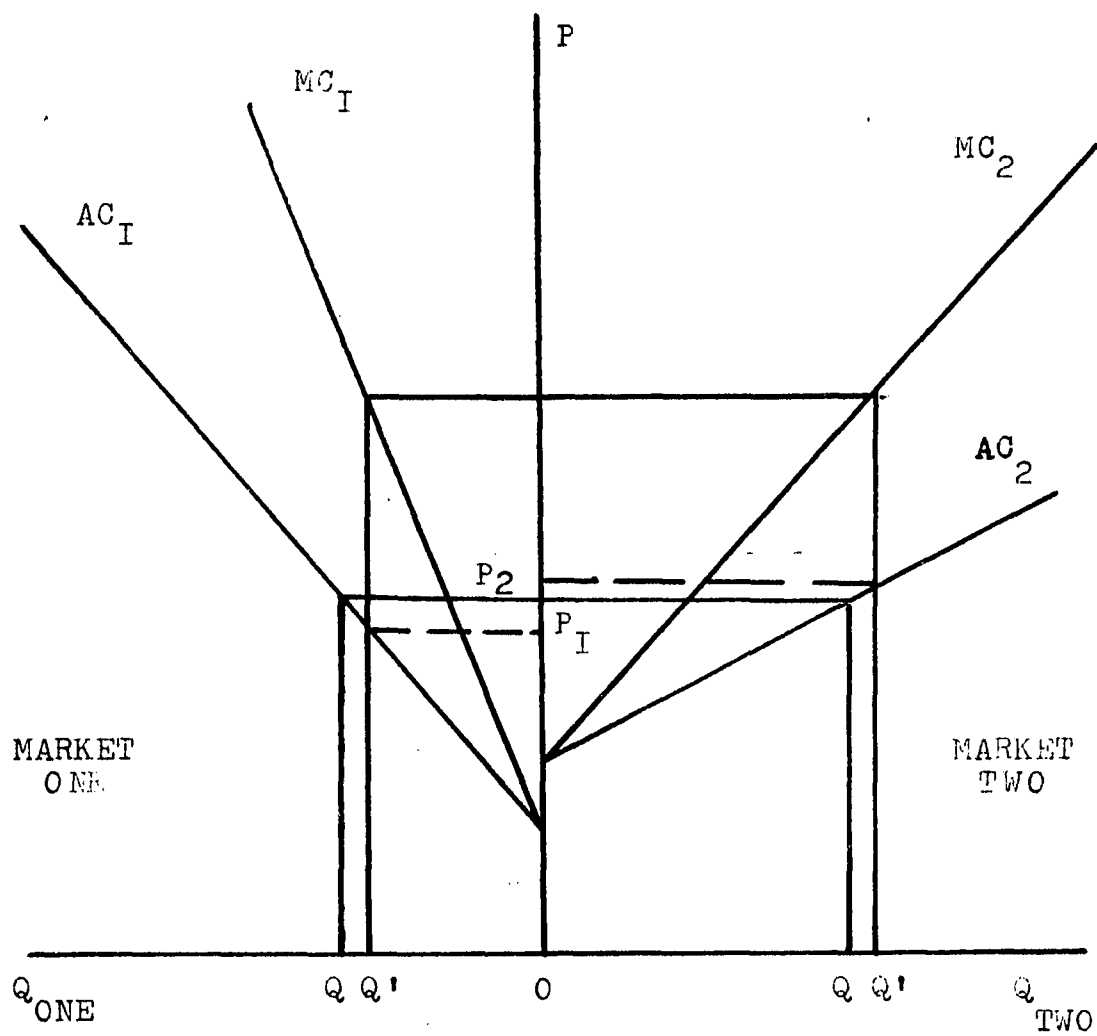
PRICE DISCRIMINATION: TWO MARKETS
EQUATING MARGINAL REVENUE
CURVES

Similarly, a state trader may not only sell goods internationally but may also purchase goods from abroad. If, in its role as importer or domestic buyer, the government trader wants to minimize its overall costs, its policies will be affected by its monopsonistic position. That is, if two sources of supply exist, the state trader will ordinarily attempt to purchase more from the market whose supply is more elastic, as in Figure 9. If the state trader simply wanted to pay one price (equate AC_1 and AC_2), it would purchase OQ in each of the two markets. But then marginal cost would be greater in Market One than in Market Two, implying foregone savings. If the trader transfers its buying from Market One to Market Two by amount QQ' , marginal costs are equated, costs minimized, and discrimination in pricing between the markets practiced.

This type of state trading behavior--buying abroad at either higher or lower prices than those at home--is not at all uncommon. Bulk purchasing abroad, for example, ordinarily involves overseas buying at lower prices than the "protected" prices prevailing in the domestic market. (Overseas supplies are usually more elastic than those in narrower home markets.) Cases where import prices are higher than home prices are obviously much rarer.

Up to this point the discussion has centered on the cases of a state trader dealing with private traders of

FIGURE 9



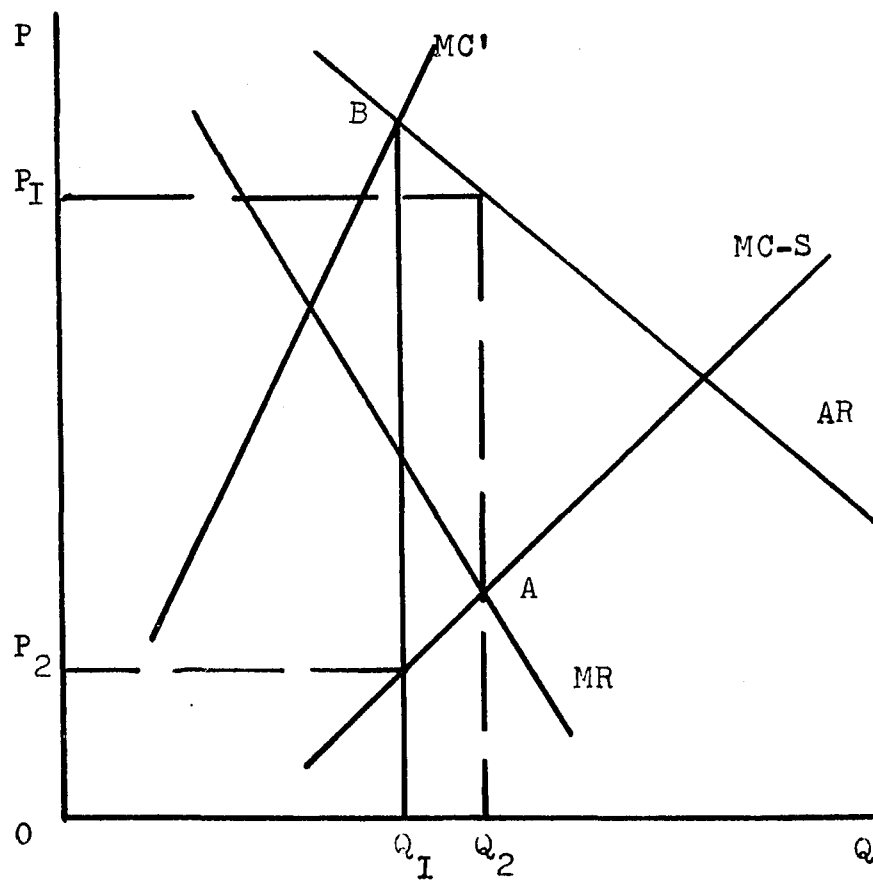
PRICE DISCRIMINATION: BUYER EQUATING MARGINAL COST IN TWO MARKETS

various sizes. However, perhaps a more pertinent case (and a realistic one) is that of a government trader dealing with another government trader, i.e., the case of bilateral monopoly. The case is of special interest when one considers recent thaws in the cold war between the United States and China, West Germany and East Germany, South and North Korea, and the growing importance of regional trading blocks.

Figure 10 depicts a bilateral monopoly situation. The curve D represents the demand curve (or average revenue curve) from the point of view of the monopoly seller, or the value of the marginal unit from the standpoint of the buyer. The MR curve is the standard marginal revenue curve as seen by the seller, derived from curve D. The MC-S curve is the marginal cost curve of the seller, seen by the monopsony buyer as a supply curve (or average cost curve). Curve MC' is the "marginal cost of buying" curve as seen by the monopsonist, derived from curve MC-S. The monopoly seller would maximize profit by equating its MC-S with MR, producing OQ_2 and selling at price OP_2 . The monopsony buyer would minimize outlay by equating the value of the marginal unit (as indicated by D) with its marginal cost (MC') from its point of view; this would mean a willingness to purchase OQ_1 at price OP_1 .

Obviously, the solution is indeterminate, with OP_1 and OP_2 being the outer price limits and OQ_1 and OQ_2 the

FIGURE 10



BILATERAL MONOPOLY: INDETERMINATE SOLUTION

outer quantity limits. In the words of C. E. Ferguson,

. . . price and quantity is indeterminate in cases of bilateral monopoly. This does not mean the market collapses or that the party fails to reach a definite agreement on price and quantity. Rather it means that the information the economist has is not sufficient to determine the precise market solution. The solution, in other words, is based not only upon conditions of demand and cost, with which the economist can deal but also upon bargaining skills and other personal characteristics anterior to the realm of economic analysis.¹⁰

In other words, state traders dealing with other state traders need more than economic analysis in finding a comfortable middle ground for prices and quantities of goods traded.

Economic Consequences of State Trading (Dynamic)

The so-called "dynamic" consequences of state trading basically include those changes of a "process" nature and can conveniently be treated under the headings of factor changes, income distribution, and economic development.

Factor Changes.--As time passes, goods price changes induce movements and changes in the supply of factors in an economy. In the case of state trading, if domestic prices of imports are held above world levels,

¹⁰C. E. Ferguson, Microeconomic Theory (Homewood, Illinois: Richard D. Irwin, Inc., 1966), p. 248.

domestic firms in import-competing industries are encouraged to expand production. Additional resources (in use or unemployed) are shifted into these lines of production which may possibly increase factor prices. Other countries which have traditionally supplied such goods find their export industries losing factors to other segments of their economies (assuming third markets do not absorb the loss in sales to the state trader). The result is that the normal tendency for factor prices to equalize between the trading nations is reduced. In addition, the passage of time will ordinarily cause the supply of the factor(s) whose price increases most to increase relative to other factors, changing the countries' factor endowments somewhat and possibly altering their comparative advantages.¹¹

Similarly, the case of overtrading (charging less than domestic prices or buying at higher international prices) can produce opposite effects. The prices of factors in each respective industry within the state trading nation will be decreased when buying and increased when selling. Resources are shifted into other production

¹¹In the other case of undertrading, exporting or "selling" above domestic prices, factor prices are decreased within the state trading nation and increased in the importing nation's import substitution industries as more resources are shifted into this area. Moreover, some factor prices will be affected more than others if export and import-competing industries utilize factors in different combinations.

industries in the first case and into export areas in the latter with the results noted above.

The above consequences, of course, assume basically free market economies. But when trade occurs between market and non-market nations (or non-market to non-market) price variations do not necessarily induce changes in factor use or prices in the non-market nations. Planned economies trade internationally in accordance with a pre-conceived overall plan. For example, in the Soviet system, planning departments first consider prevailing commitments and requirements for domestic output. Thereafter, in order of priority, the all-union Ministry of Foreign Trade plans trading activities in line with the overall national plan. Direction, volume, prices, and costs are devised in coordination with the State Planning Committee, Council of Ministers, and the State Bank. Corporations (monopolies) conduct the domestic activities needed to engage in foreign commerce while the Ministry of Foreign Trade operates abroad through trade delegations or commercial agencies.¹²

Each corporation or enterprise is expected to produce planned profits in accordance with pre-conceived margins. Prices (sales) are in accordance with accepted

¹²Nicolas Spulber, The Soviet Economy: Structure, Principles, and Problems (New York: W. W. Norton and Co., Inc., 1962), pp. 100-105. See also: Nicolas Spulber, "The Soviet-Bloc Foreign Trade System," Law and Contemporary Problems, Summer, 1959, pp. 420-53.

norms with a markup ranging from 1 to 50 per cent of the domestic wholesale price. However, because of the variance in trading motivation (which is subject to many non-monetary considerations),

. . . each Soviet agency tries to maximize profits on individual transactions, the Ministry of Foreign Trade considers the relation of total values of exports and imports traded with any given partner and attempts to maximize the difference between them in internal Soviet wholesale prices. In order to obtain an import that is particularly sought after, the ministry will readily enjoin the trading agency to sell below cost.¹³

Obviously, in cases like this state trading monopolies need not accept or charge prices that are in line with commercial considerations.¹⁴ In many cases use of factors (and their prices) can be subject to shifts in national plans rather than a result of movements and changes in trading patterns.

Income distribution.--If internal production structures are changed by state trading (as they ordinarily will be), it follows that income distribution will nearly

¹³Spulber, The Soviet Economy, op. cit., p. 105.

¹⁴Moreover, as revealed by Holzman and others, price discrimination is a relatively common practice between the Soviet Union and its satellites and Europe. See: Franklyn D. Holzman, "Soviet Foreign Trade Pricing and the Question of Discrimination," Review of Economic and Statistics, XLIV (May, 1962); and H. Mendershausen, "Mutual Price Discrimination in Soviet Bloc Trade," Review of Economics and Statistics, XLIV (November, 1962).

always be affected as well. In market countries, selling imports internally above world prices or selling exports abroad above domestic prices (undertrading) both tend to expand import-competing industries at the expense of export industries; similarly, overtrading tends to expand export industries at the expense of import-competing industries. If import-competing industries are, say, labor intensive while export industries are capital intensive, undertrading would tend to benefit labor and overtrading to benefit capital. These changes in income distribution could then be expected to influence future demand patterns, savings and reinvestment rates, and so forth.

Economic development.--State trading can also be used to encourage (and perhaps discourage) economic development. That is, governmental trade can be of assistance or can create conditions conducive to expansion of national incomes. For example, in consequence of increased nationalism and increased Sino-Soviet Bloc influence, many Far Eastern nations have introduced state trading for developmental purposes.¹⁵ Although not always successful, these nations have negotiated bilateral contacts with other

¹⁵The list of such nations include: Australia, Burma, Cambodia, Ceylon, China (Taiwan), India, Indonesia, Japan, Laos, Malaysia, Nepal, New Zealand, Pakistan, Phillipines, Republic of Viet Nam, and Thailand. See: United Nations, State Trading in Countries of the Asia and the Far East Regions, op. cit.

countries which, because of their trading structure, require government to government exchange. As noted earlier, Burma's experience was unsuccessful due to the nature of its fixed contracts under changing world market conditions. However, not all concerned nations have experienced difficulties. Australia, India, and others have received quite favorable influences from governmental exchange.¹⁶

Basically, these countries seek firm contracts which allow for the meeting of plans that require fixed supplies and/or revenues. If successfully obtained, development may proceed without some of the competitive risks involved in private commerce. Foreign exchange earnings are more secure and can be conserved with barter; investments are easier to carry out with steady streams of foreign exchange earnings; and just as in the case of free trade, favorable trading conditions can be created with trading partners. In addition, variations in the prices of contracted goods can alter income. For example, offering lower prices for exports has the same basic result as an exchange depreciation with its resulting stimulation of exports.¹⁷ Hence, in total, state trading can allow for

¹⁶United Nations, State Trading in Countries of the Asia and the Far East Region, op. cit., pp. 10-20.

¹⁷Richard I. Leighton, Economics of International Trade (New York: McGraw Hill Book Co., 1970), pp. 269-276.

more stable generation of income and development, assuming favorable conditions prevail in the affected nation.

CHAPTER IV

THE COMPARATIVE COST DOCTRINE AS A THEORY OF STATE TRADING

From the preceding, it is evident that state trading is a unique form of international commerce. But can the behavior of state traders be explained with traditional international economic theory? Can it explain what goods will be exchanged and at what prices (terms of trade), for example? This traditional theory (usually called the "comparative cost" doctrine) has been the mainstay of most "western" economists for many decades. However, as noted earlier, governmental trade can develop from a variety of motives and with many varied ends. How applicable then, is this theory to those areas where trade arises for reasons other than those of production and cost efficiencies?

The Comparative Cost Doctrine

Pure form.--Actually, the doctrine of comparative costs (or comparative advantage) has varied somewhat in form as it evolved. Most economic historians give credit to Robert Torrens for his rudimentary statement of comparative advantage, but David Ricardo and John Stuart Mill have

shared most of the recognition.¹ Ricardo, with his classic "wine and cloth" example, illustrated the mutual advantages to be gained through exchange. Under free trade conditions, each nation tended to specialize in those commodities whose production costs were relatively cheaper and import those items in which domestic producers had a comparative cost disadvantage.²

The model presented by Ricardo (and later refined by Mill and others) was based on the labor theory of value and explicitly assumed full mobility of factors of production within a nation but complete lack of factor mobility between nations. Hence, only one input (labor) and two commodities and two nations were utilized.³ Moreover, the hypothesis implicitly assumed possible differences in production functions between the trading nations.⁴ Comparative advantage, according to Ricardo, was thus based on

¹William R. Allen, ed., International Trade Theory: Hume to Ohlin (New York: Random House, 1967), p. 4.

²Ibid.

³Gottfried Haberler, A Survey of International Trade Theory, Special Papers in International Economics No. 1 (Princeton University: International Finance Section, 1961), p. 4.

⁴Bela Balassa, "An Empirical Demonstration of Classical Comparative Cost Theory," Review of Economics and Statistics, XLV (August, 1963), 231-238.

relative cost differentials arising from relative productivity differentials.⁵

Mill, in his reformulation of Ricardo's concepts, used basically the same analytical technique.⁶ However, rather than restrict the explanation to a specific exchange ratio as Ricardo had done, Mill dealt with the possibility of a range wherein the terms of trade could lie. After opening up trade, if each country exchanged goods within the range established by their domestic cost ratios, both would mutually gain from exchange. The exact outcome or exchange ratio was established by "reciprocal demand" with exports purchasing imports.⁷ Alfred Marshall later expressed this reciprocal demand in terms of "offer curves" of exports in exchange for imports. So-called "representative commodity bales," containing a fixed quantity of labor embodied in a vast number of different commodities, were offered by each trader. Each offer curve reflected both that country's willingness and ability to supply exports as well as its demand for the other country's exports.⁸ Marshall's analysis represented a movement from a partial

⁵Ibid.

⁶Mill's analysis was of a more general form than Ricardo's and stressed different outputs produced by given labor inputs instead of given outputs with variable inputs.

⁷Allen, op. cit., p. 13.

⁸Haberler, op. cit., p. 9.

equilibrium analysis. That is, each point along his offer curve was a possible point of equilibrium with the concerned nations adjusting their internal economies to the new positions.⁹

Between Ricardo's and Marshall's writings a number of others made significant contributions, but for the most part their analysis added to rather than changed the original comparative cost doctrine.

Today, however, modern trade theory utilizes "opportunity costs" rather than the "real costs" theories of the early classicists. Moreover, economists have tried to explain why comparative advantages may or may not exist. Much of the credit for work done in this area belongs to Bertin Ohlin and his former teacher, Eli Heckscher.¹⁰

Ohlin set up a system only partially similar in assumptions to those previously described in that:

- (1) factors were free to move within a region but not across national boundaries;
- (2) two nations existed in which trading could occur;
- (3) production functions were identical between the nations with qualitatively identical factors of production;

⁹Ibid., p. 10.

¹⁰Ibid., p. 16.

(4) many commodities and factors of production were present; and

(5) a fixed rate of exchange was established.¹¹

Ohlin, like his predecessors, also assumed perfect competition, full employment, and no tariffs or transport costs. Within the framework each nation specialized in those goods it could produce the cheapest in money terms only, not in terms of labor or other factors. Price differentials arose primarily because of the different factor endowments of the trading nations. A country thus exported those items that used intensively those factors that were most abundant. Conversely, it imported those commodities which used intensively the scarce factors.¹² Comparative advantage existed in the first instance with a comparative disadvantage in the second case.

Briefly stated, then, Ohlin explained comparative advantages in terms of factor endowments, not in terms of different production functions as his predecessors had. But in substance trade was still explained in terms of comparative costs. Since his contribution, there have been additions, modifications, and tests of his hypothesis but

¹¹Ibid.

¹²W. M. Corden, Recent Developments in the Theory Of International Trade, Special Papers in International Economics No. 7 (Princeton University: International Finance Section, 1965), p. 28.

basically it stands today (with qualifications) as the major "generalized" explanation of trade.¹³ The question relevant here, however, is whether it is sufficient to explain the trading patterns emerging from state trading.

Comparative Costs as Applied to State Trading

As may be surmised from what has been said, the comparative cost doctrine has been an attempt to explain the behavior of market-oriented economies. That is, the motivation behind trade has been one of profit, with possible restraints. Nations exchange goods with the expectation of some possible gain, which is usually monetary in form. Indirectly, increased specialization is expected to enlarge total output so that all traders can and do gain from the exchange.¹⁴ Or at least traditional theory has emphasized this view.

But state trading may not be motivated primarily by economic considerations. Moreover, even if it is for strictly economic reasons, the direction and pattern of

¹³For example, discussions have been carried on as to the (1) factor price equalization tendency of the Heckscher Ohlin model; (2) testing of the assumptions, especially the idea of identical production functions; (3) testing of the main tenets themselves by Leontief (leading to his "paradox"); (4) general refinements and additions to the theory such as economies of scale, technical change, and the inclusion of more than two countries and two commodities. See: W. M. Corden, op. cit., pp. 24-34.

¹⁴Not necessarily equally, however.

exchange may be completely different from what comparative costs would indicate. For example, in the non-market case so amply portrayed by the Soviet Union (and other communist bloc nations), trade has followed directions that in many instances have not been along lines of comparative advantage.¹⁵ The framework of the Soviet system is such that the doctrine has been incompatible with their operational setup.¹⁶

Non-market economies.--Specifically, the comparative cost doctrine has implicitly assumed that prices were proportionally related to costs, i. e. that effective competition prevailed. However, pricing practices within bloc nations do not correspond closely to costs of factors or to demand conditions in product markets. Instead, prices have been fixed by planning commissions and are regarded more as planning tools than as signals of scarcity or utility. Nor do Communist economists readily accept the idea of marginality upon which comparative advantage rests. Western economists have assumed prices of factors to equal their marginal products along with product prices equalling

¹⁵Other similar examples could be cited. For example, for the Chinese case see: Yuan-Li Wu, The Economy of Communist China (New York: Fredrick A. Praeger Publishers, 1966), pp. 150-200.

¹⁶J. Wilczynski, "The Theory of Comparative Costs and Centrally Planned Economies," Economic Journal (March, 1965), 61-65.

marginal costs. Without the notion of marginality, gains or advantages from trade cannot be readily shown.¹⁷

Similarly, plans rather than price differentials determine the export of commodities. Exports, in fact, have been viewed as a necessary sacrifice to acquire needed imports. In many cases development plans require certain goods and services that cannot always be obtained domestically. As a result the Communists view trade as a means of securing those items essential to fulfillment of their plans. Of course, imports may be obtained by the "unwilling" loss of export items, and have indeed been so obtained. In addition, exports may sometimes be reflections of planning mistakes--i. e., overproduced items which officials would rather dispose of abroad than domestically. Hence, those goods exchanged do not necessarily (if at all) correspond to those commodities that would be traded if comparative advantage were followed.

The bloc nations have also viewed trade as a political tool. Since they want to minimize dependence upon Western or other non-Communist sources, exchange has been undertaken only when the results were consistent with the meeting of non-economic (as well as economic) considerations and/or plans. For instance, the Soviet Union has supplied Italy with crude petroleum for years at very

¹⁷Ibid.

favorable prices, gaining not only hard foreign exchange but a measure of economic and political dependence at the same time.

Finally, exchange rate practices do not allow for an exact correlation between prices and costs (even if they reflected comparative costs). Official rates usually have been at such levels as to arbitrarily overvalue bloc currency. The result has been further distortion of bloc prices and costs. In summary, one writer described the feelings of Soviet economists toward the doctrine of comparative cost as:

. . . a pseudo-scientific, reactionary foreign trade theory disseminated by bourgeois economists . . . to serve as a theoretical basis for the Western discriminatory foreign trade policies toward Socialist countries.¹⁸

It is worth noting, however, that the Soviets have (in the "research" stage) been paying increased attention to indices of efficiency in exports (and to a smaller degree in imports). Such indices reveal a growing dissatisfaction with the inherent weaknesses of their present trade system. In their search for some kind of foreign trade profitability criterion, planners hope that the indices may provide a method of measuring the economic gains or losses from exchange. For example, one index--the "book keeping efficiency of exports"--provides information on the profitability of exports to the foreign trade corporations within

¹⁸Ibid., p. 66.

the Soviet system.¹⁹ Other indices provide similar data for those segments deemed in need of a guide to the gains from trade. However, such studies have been subject to limitations because of uncertainty about what should or should not be included as variables. More important, however, has been the problem of when to use the information the indices have provided. As J. Wilczynski put it,

The economic leadership, for the time being, is very cautious in acting on the results of efficiency calculations except in extreme cases

The same writer concludes that:

The structure of foreign trade has changed little as a result of these studies. The final decision on the structure and direction of foreign trade takes into account non-commercial considerations, which in many cases assume the main importance, overriding efficiency calculations.²⁰

The general conclusion concerning state trading in nonmarket economies, then, is that they do not necessarily adhere to the principles of comparative advantage when other factors outweigh the efficiency aspects of trade. Non-market economies have been structured to forms which cannot

¹⁹More specifically the index compares export revenues with local sale prices or: $bE = \frac{Rd}{P + mc}$ where

bE = Bookkeeping efficiency of exports

Rd = Official exchange rate value of foreign exchange

P = Domestic wholesale prices trading corporations pay to local enterprises

mc = Local portion of marketing costs

See: Wilczynski, J., op. cit., p. 70.

²⁰Wilczynski, op. cit., p. 79.

be fully rationalized by "Western" explanations of exchange.

Market economies.--Next, a more difficult case needs inspection: do "market" economies conform to comparative advantage in their state trading activities?²¹ If the government trader behaves in the same fashion as a private trader, the answer would have to be a qualified yes. Of course, this assumes that comparative cost is accepted as an explanation of private exchange and that the state trader is functioning essentially as a private trader. But other cases cannot be dismissed as easily.²²

Earlier it was pointed out that the comparative costs doctrine is generally recognized as the major explanation of trade, but that trade can take place for other "economic" reasons that are not necessarily consistent with comparative advantage. For instance, it has long been recognized that countries may encourage exports (by subsidies, etc.,) in order to achieve economies of scale. Although there may be no initial comparative advantage in the industries concerned, it is possible that they may later emerge as output enlarges and unit costs decline.

²¹The assumption here is that trade takes place only between market economies, not non-market to market.

²²Of course, each particular nation would have to be analyzed separately. However, certain general conclusions can be reached concerning exchange among "recognized" market economies.

The above has been typical of many Latin American, African, and Far Eastern nations. Being relatively underdeveloped, they have used trade channels to expand industry via both export expansion and import substitution--in other words, by means of intervention, which is ordinarily considered anti-comparative advantage in nature. This interference has sometimes been in the form of direct subsidies to the industries desired, and sometimes in the form of (or coupled with) state trading. In any case, government trade does not necessarily have to conform to the prices and the directions of trade dictated by comparative advantage (although it may).

Another example of non-comparative advantage trade among market economies is that of underdeveloped countries suffering from severe shortages of foreign exchange. Governments often use state trading to enlarge the number and volume of exports in order to augment their foreign exchange receipts, as well as to limit so-called "unnecessary" imports.

However, perhaps of greater significance is the realization of what comparative costs emphasize. That is, it has been and remains primarily a supply-oriented explanation of trade. Demand plays little if any role in the "pure" form of the doctrine. Later economists added demand conditions, but for the most part they have been

additional theories in themselves.²³ Under such a supply interpretation, state trading can be readily shown to create changes in production that can possibly divert trade away from comparative advantage areas. For instance, in the earlier discussion of the economic consequences of government trade, it was noted that a state trader may attempt to buy or sell goods below or above current market prices. As a result certain domestic (or foreign) distortions appeared in the consumption and production of the traded item (or its substitute). These distortions in many cases manifest themselves through the supply of the commodity.

Again, many countries have agricultural policies (such as those of the United States) which artificially keep certain commodity prices above world market prices and ordinarily stimulate domestic production of such goods. Surpluses have resulted which in many cases have been purchased by their respective governments and later sold internationally. If it is the policy at the time of the sale to sell at current world prices (lower than domestic), the government trader has indirectly encouraged domestic

²³Demand (tastes and preferences) may help explain the desire to purchase certain items from sources that do not offer the lowest relative prices. For example: the United States buying of strategic items only from "friendly" nations. Other cases could be cited.

production which may or may not be in line with the comparative advantage of the concerned nation.²⁴

Generally, then, the state trader can alter supplies and demands by creating conditions which induce or hinder the production or consumption of traded goods. And the resulting direction of flow, composition of trade, and prices of traded goods may have little or nothing in common with comparative advantage.

Modification to Comparative Cost Doctrines

If comparative costs in its basic form is not completely applicable to the cases of government trade, can it be modified? Or can other theories be applied? To both questions the answer is a tentative "yes." A modification is considered in the remainder of this chapter, while other theories are taken up later.

Offer curves, though relatively old, are (ironically) uniquely suited to analysis of today's revival of exchange under barter conditions. Many countries, notably the non-market ones, negotiate bilateral contracts which in many instances require the exchange of one commodity against

²⁴The writer is aware that the basic purpose of United States agricultural policy has not been the creation of goods for sale to the government to be stored or later resold. The point is that the possibility of later resale (gaining revenue for the government) may be of some significance in the argument for the maintenance of domestic price supports and of greater importance in explaining distortions in resource use.

another.²⁵ As noted earlier, the graphic reflection of preferences of this nature was originally created by Alfred Marshall using his so-called "representative commodity bales."

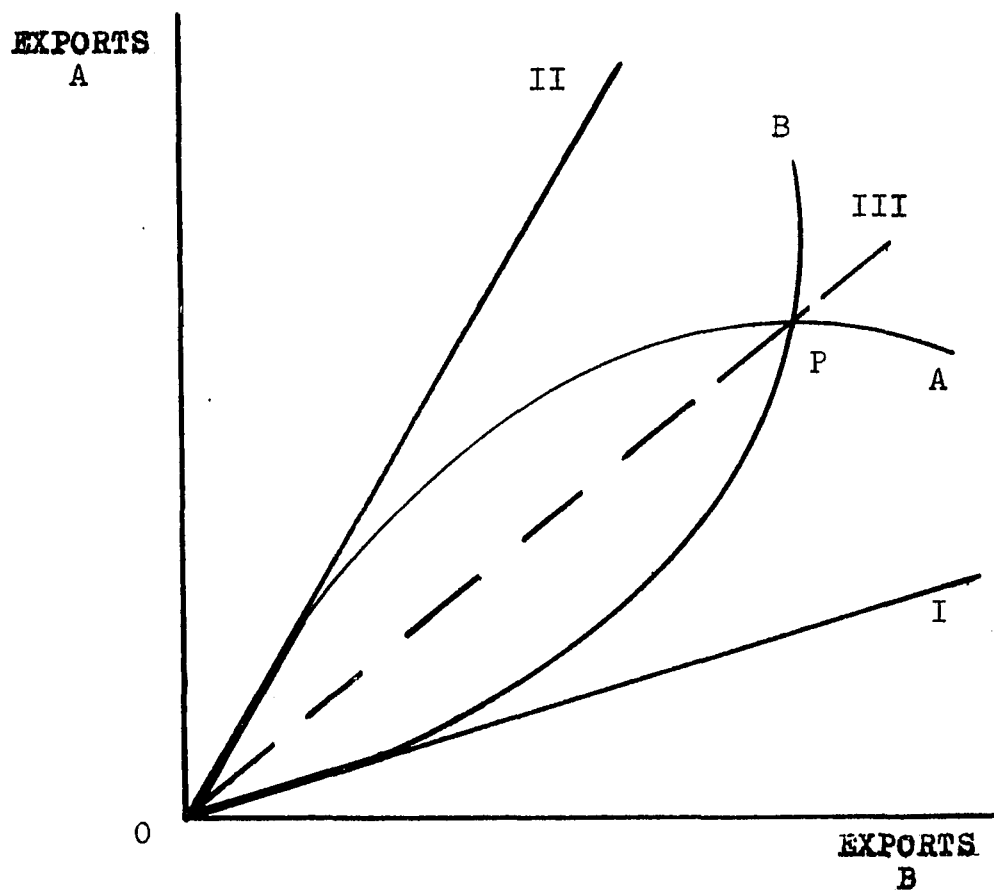
Specifically, offer curves or reciprocal demand curves reflect the willingness of one nation to exchange a certain bundle of export goods against the exports (also a certain bundle) of another. Each point on a curve represents a definite amount of one good offered for a specific amount of the demanded good. When both countries' offer curves are considered, their intersection represents the same price in both countries for the two traded items.

Figure 11 may help illustrate offer curves and how they may apply to state trading. Two goods are exchanged, A-exports and B-exports, from countries A and B. Curves A and B represent the offer curves of state traders A and B. As the graph indicates, many prices (of one good in terms

²⁵Barter between free trading nations normally varies somewhat from the described situation. There usually exists a middleman--a barter specialist, commodity broker, or bank. Basically he arranges for each commodity to be exchanged for cash or foreign exchange. For example, the broker may notice a surplus in nation One. He then attempts to find a commodity in nation Two which nation One would like to have. Finding such a good, nation Two is contacted and a price agreed upon, which is usually a cash price. Nation One is then offered the good in exchange for the agreed upon cash value of his commodity. The profit or price differential depends on market conditions and the bargaining skill of the middleman.

See: Staff, "Barter is Respectable," The Economist, CCXVIII (January 29, 1966), 428-29.

FIGURE 11



OFFER CURVES: TWO STATE TRADERS (ECONOMIC
CONSIDERATIONS ONLY)

of another) are possible. These price ratio lines extend from the origin outward and reflect (for example) higher import prices (and lower export prices) for nation A as the slope of the price lines increase. (Conversely, nation B would receive more favorable prices.) Note that the offer curves are tangent to price lines I and II. Price line III represents the equilibrium price (or terms of trade) as determined by the given set of curves. Price lines I and II are especially important for they indicate the limits of the offer curves under normal conditions--they represent the domestic prices of goods A and B in the two countries. As one writer put it:

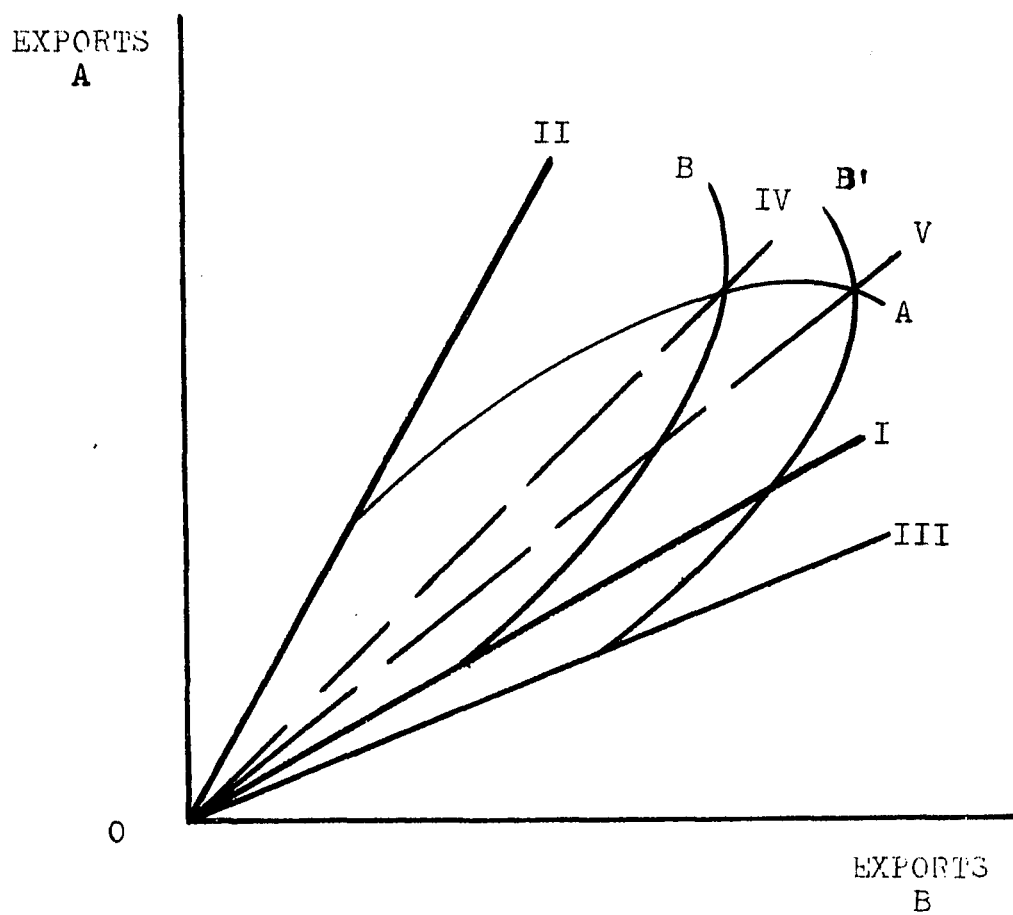
. . . the price line is a limit beyond which the offer curve cannot go. This is obvious enough, no country will export products for less in the way of imports than it can produce in import-competing goods at home.²⁶

For the state trader, however, these "outer limit" price lines could be wider apart (or closer together) if non-economic considerations were allowed to influence a country's offer curves (i. e., if the relative cost of producing A and B was not the only determinant of the position and shape of the offer curves). For example, if the offer curves were drawn to include political as well as economic (cost) preferences, the limits (price lines) might reveal an enlarged bargaining zone--an area subject to

²⁶Kindleberger, op. cit., p. 40.

negotiation, with the barter outcome influenced by the economic and political power of the concerned parties. This could occur if the trade preferences of the trading governments rested on non-economic considerations such as strategic goods needed for defense or the desire to provide development assistance to poorer countries. Figure 12 may be helpful in illustrating this. Recall that the offer curves show a country's willingness to give up a bundle of one good for a bundle of another. Suppose initially that offer curves A and B reflect economic conditions (or considerations) only, line IV is the equilibrium price line, line II reflects country A's internal costs of production, and line I reflects B's. Now suppose that country B introduces a political element into its trade preferences--let's say it wishes to assist economic development in A through extremely favorable prices for A's goods. This political element may be shown graphically as a lowering of B's "base price" line from I to III, the "wedge" or angle between these two lines reflecting the intensity of the economic sacrifice B is willing to make in order to get a political "gain." Offer curve B is the all-inclusive (economic and political) offer curve, and X is the new terms of trade line. Note, however, that line III is not consistent with domestic economic opportunity costs in B.

FIGURE 12



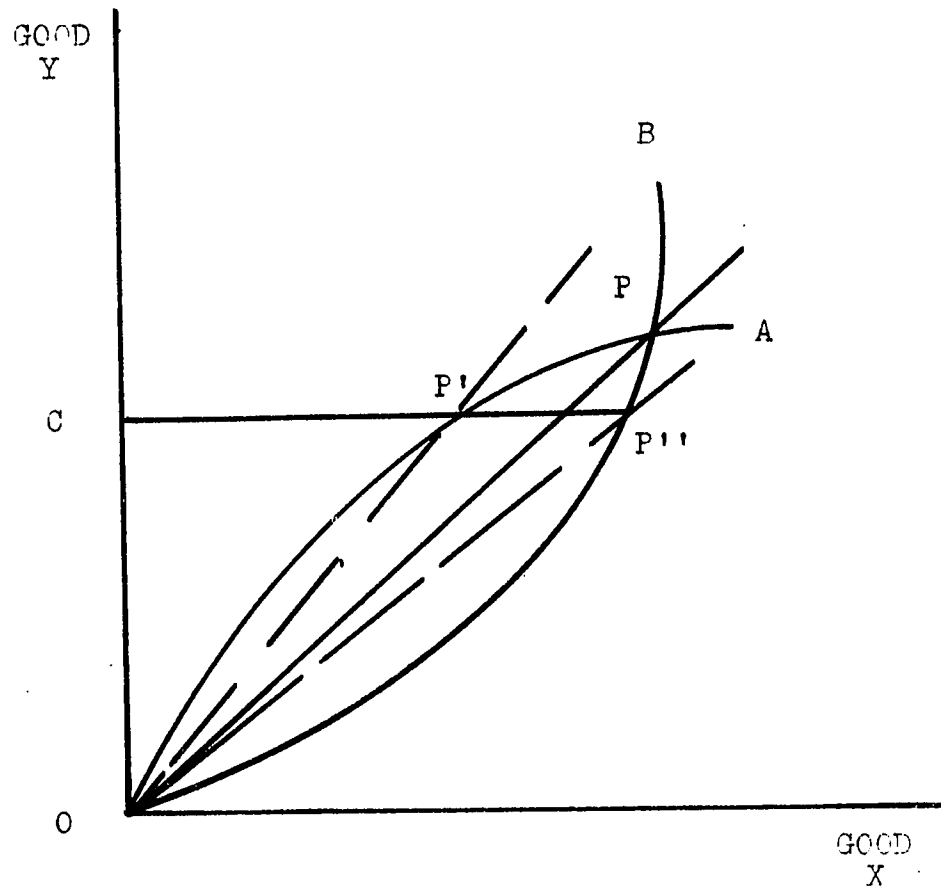
OFFER CURVES: TWO STATE TRADERS (ECONOMIC AND
POLITICAL CONSIDERATIONS)

Figure 12 might also reflect a strong political preference for good A by country B. Good A might be considered militarily important, perhaps, or good B might be deemed harmful politically, or at least of little political value. The Soviet Union, for example, reputedly mines gold and sells it abroad at a loss, presumably because (1) it is politically and perhaps economically useless within Russia, (2) it is widely demanded both economically and politically outside Russia, and (3) it is a sure-fire way of obtaining foreign goods of greater strategic, political, or economic value for Russia.

Offer curves may also be used to reveal the wide range of alternative prices available to a state trader. In Figure 13 the government trader (B) restricts its imports of good Y to OC. As a result prices may fall from P to P', or rise to P". Or they may lie at any point between P' P". As previously pointed out, the solution becomes theoretically indeterminate.

In conclusion, then, it is evident that the state trader does not necessarily conform to trading patterns traditionally explained by comparative costs doctrines. This is especially true within non-market nations and in market economies when non-economic considerations dominate exchange policies. Even when traditional theory is modified, it is not completely satisfactory for all the

FIGURE 13



OFFER CURVES: BARGAINING ZONE

possible situations that can arise. Are there other, better methods of explaining the limits, resulting prices, and direction of trade? The next chapter considers use of game theory and suggests a bargaining model more applicable to state trading in many respects than those considered so far.

CHAPTER V

GAME THEORY AS APPLIED TO STATE TRADING

In the previous chapters it was noted that in some instances of state trading, prices (the terms of trade) and the direction of traded commodities cannot be fully explained by traditional theory. The cases of bilateral monopoly have been debated and refined for many years. Proposals by Edgeworth and others have illuminated possible solutions but have also revealed many difficulties.

In the early 1940's, Von Neumann and Morgenstern introduced their pioneering work in the field of game theory. Since their original study, many others have added to the existing body of knowledge. This chapter examines those variations of game theory which appear to best fit the various cases of state trading. Several approaches--beginning with a broad overview (macro) and ending with a narrow (micro) examination--are utilized to reveal the relevance of game theory.

Assumptions of Game Theory

In any attempt to present an explanatory model of government trade, it is of utmost importance to establish what game theory is--not only its strengths but its

limitations. Basically, it is a branch of mathematics which utilizes formal models in the analysis of decision making within the realm of conflict.¹ Problems involving opposition between two or more parties (with cooperation possible, also) are subject to inquiry.² The motivation for participation may be economic, political, psychological, or any other force behind human endeavors--including those found within state trading.

The word "game" implies that two (or more) sides are participating, with the outcome dependent to a degree on the activities of all "players." The theory has as its main objective the finding of rational decisions or choices for the opposing sides. However, since real world situations are subject to many forces and pressures, a model capable of being handled and solved must be limited and simplified. When this is achieved, the result or model is referred to as a "game."³

Moreover, unlike real world games, a formalized model must be constructed and solved according to some preconceived and defined rules. Such conditions limit and

¹Martin Shubik, ed., Game Theory and Related Approaches to Social Behavior (New York: John Wiley and Sons, Inc., 1964), p. 8.

²Ibid.

³E. S. Venttsel, An Introduction to the Theory of Games (Boston: D. C. Heath and Company, 1963), p. 1.

channel the action of the players during the decision-making periods within the game. When making moves according to a determined strategy, the result or outcome can usually be quantitatively represented by a number of measures, including utility. When a game is assigned a numerical result, a payoff, each player can share (in different proportions) in the benefits.

A variety of approaches may be taken in applying game theory to state trading. For example, if the total payoff to two parties is fixed, so that one trader must give up what the other gains, the game is "zero-sum" or "constant sum" in nature. This is the simplest type of game, and is reasonably applicable to the state-trading situation.⁴

Non-zero-sum games, where winners may gain more or less than losers give up, may be more typical of real-world games or conflict situations, but are more complex at the same time.

In addition, players may be assumed to make moves reflecting pure personal or rational choice, with no element of chance involved, or chance may be included. If chance is not a factor, payoffs are a certainty; if chance enters, a probability distribution of payoffs is necessary.

⁴Of course, this assumes that the state trading case under consideration is the simplest in form and all values in the game can be calculated.

The degree of ignorance is another determinant of game payoffs. Perfect information may be assumed--implying that each side knows the available plays and all previous ones--or, more realistically, partial or total ignorance may be assumed.⁵

As can be thus surmised, limitations are necessary if a definite game is to be created--a game with a finite solution. Given the above workings of game theory, a rational solution can be presented for the case of state traders with complete or incomplete information, personal choice and chance moves, and a zero-sum or non-zero-sum payoff.

The Zero Sum Game (Two State Traders)

As noted earlier, a zero-sum game exists when a payoff to one player is exactly equal to the losses of the other player. In other words, the interests of the participants are completely opposed. In order to determine which moves to make during the game, the player (state trader) can decide beforehand on the specific choices available. That is, he can conceive of all the possible situations and develop all possible appropriate moves. For any solvable game, the number of choices must be limited to a finite figure. In government trading cases, these choices

⁵A personal move or choice eliminates the necessity of a probability distribution for the chance selections.

may regard the number of bargainers, location of talks, size of the trading "package," and so forth.

At this point it may be appropriate to point out a major difficulty in selecting the alternative strategies. The state trader can be assumed to represent a single entity with its own preferences or desires; or it can be assumed to represent the collective wants of the citizens of the representative nation. In either case, however, some expression must be made about the utility of a particular strategy. It is necessary, then, to become involved with measuring utility and making interpersonal (or inter-country) utility comparisons. And this is a truly major problem in the real world.

Originally, some early writers (i.e., Menger, Jevons, and Walras) assumed utility to be measurable and capable of comparison between individuals.⁶ Moreover, the utility of one good was assumed to be independent of that of other commodities that were consumed. Later writers such as Marshall and Pareto avoided these assumptions with the indifference approach (where only ordinal measurements were required) and thereby reduced the importance of the early cardinal measures.⁷ However, in state trading, approached

⁶Mark Blaug, Economic Theory in Retrospect (Homewood, Illinois: Richard D. Irwin, Inc., 1968), p. 327.

⁷C. E. Ferguson, Microeconomic Theory (Homewood, Illinois: Richard D. Irwin, Inc., 1966), pp. 19-20.

through game theory, the basic problem of utility measurement remains. With the cardinal utility approach, comparisons can be made using standard utils of satisfaction. Ordinal measurements do not allow for such a finite comparison. Yet in the selection of strategies for the government trader, it is often assumed that cardinal measurements can be made--an assumption highly questionable at best.

Even with this important flaw, it is still possible to gain useful insights into the state trading process by means of game theory. After all, community indifference curves are theoretically impossible to construct without making interpersonal utility comparisons, but they are used nonetheless (see Chapter IV) with some very satisfactory results.⁸

There are various ways to handle the difficulties involved in cardinal measurements of utility. Models can be devised that avoid interpersonal comparisons; hypotheses can be modified with restrictive assumptions concerning behavior and values--for instance, using money as a common measure; or cardinal utility measures can be assumed to exist. All three approaches may be utilized, depending upon certain conditions.

⁸For a discussion of community indifference curves, see: Kindleberger, op. cit., pp. 44-46.

A Simple Game Theory Model

Suppose two state traders are confronting one another over a trade "package," with one basically a buyer and the other basically a seller. For purposes of illustration, it can be assumed that they desire similar ends (profits or prestige) and that what one gains, the other must lose (in an opportunity sense). The gains (losses) are measured in "utils" and are derived from getting favorable (unfavorable) prices, quantities, commodity mixes, qualities, and degrees of political and economic dependence. Assuming only two strategies available to each for the sake of simplicity, the result is a "zero-sum, two person, two strategy game," in the language of game theorists. The "payoff matrix" is displayed in Figure 14 and represents the seller's point of view (although the buyer must lose what the seller gains in a zero-sum game). Note that the exporter (seller) has two strategies available to him. The outcome of the strategies can, of course, be assigned utility values that are not necessarily consistent with market behavior. That is, if profit maximization is not the goal, high prices or large quantities may not be sought but some other outcome with higher utility.⁹ However, if

⁹Utility in this instance could include economic, political, military, or other such values. These possibilities will be analyzed later. Note, too, that both state traders must share the same utility functions in this zero-sum example.

FIGURE 14

BUYER SELLER	STRATEGY A_B	STRATEGY B_E	ROW MINIMUM
STRATEGY A_S	12	10	10*
STRATEGY B_S	5	8	5
COLUMN MAXIMUM	12	10*	

PAYOFF MATRIX: ZERO SUM GAME WITH SADDLE POINT

profit is the main objective for both traders, a higher-than-market price (or larger quantities, perhaps) would give the state trader (exporter) the highest utility from the available choices. If the importer (the other player) is motivated by similar objectives, his best strategy might include a purchase "below" market prices.

In Figure 14, the seller's two strategies are arrayed down the side and the buyer's across the top. If the seller employs his strategy A while the buyer does likewise, for example, the seller will receive 12 utils of satisfaction (and the buyer will lose 12). If the seller uses A and the buyer B, however, the payoff will be only 10.

As can be noted from the matrix, if each state trader attempts to seek his most advantageous position, the buyer will choose strategy A, and the seller strategy B. By selecting A, the seller ensures that he will receive at least 10 utils, no matter what the buyer does, and the buyer ensures that he will lose no more than 10, regardless of what the seller does. Perfect knowledge and intelligent choosing would thus gain the seller 10, and lose the buyer 10 (his minimum loss). The seller will choose the strategy that maximizes the minimum he can gain (maximin), while the buyer will try to minimize the maximum he can lose (minimax). These amounts are starred in Figure 14.

The game shown in Figure 14 is both simple and trivial, however. The optimum strategy is so straightforward

and the payoffs so certain that it has little resemblance to most real-world conflict situations. For example, it tells us nothing about the chances lying behind the payoff figures shown, and these "chances" may reflect not only "luck" or nature's tricks with payoffs, but the respective power positions of the traders, as well. Let us suppose that the payoff of 12 utils to the selling state trader when he (or they) selects (select) strategy A and the buyer also selects A is a long-run average payoff derived from the following set of probabilities:

- A zero probability of 3 utils payoff;
- A 50% probability of 6 utils;
- A zero probability of 9 utils;
- A zero probability of 12 utils;
- A zero probability of 15 utils, and
- A 50% probability of 18 utils.

The seller's expected payoff of 12 is thus the result of $50\% \times 6$ utils plus $50\% \times 18$ utils, the other payoffs having no possibilities; note that he never actually receives 12, only 6 or 18 in equal proportions over the long run. These payoffs may be the only open ones because nature has blocked the others, or perhaps because actions by the buyer have blocked them (chance and power position may both be reflected, therefore).

Chance, however, does not change the long-run payoff matrix, and if Figure 14 reflects the long-run average

payoffs with chance fully taken into account, the optimum choice of strategies is still the same: A for the seller in each game, and B for the buyer.

Figure 14's payoff matrix is still something of a special case, however--even if probabilities (or chance) are taken into account. Note that the seller's maximin and the buyer's minimax are both the same in terms of payoff utils--10, in this case. This game, therefore, has what game theorists call a "saddle point"--the seller's smallest minimum coincides with the buyer's largest minimum, the seller viewing the "saddle" from the side and the buyer from a fore-and-aft direction parallel to the "saddle." And games with saddle points are strictly determined, with a solution easily determined by inspection. But what happens if a game does not have a saddle point?

In Figure 15 the seller's row minimums are 10 and 8, and his maximin is 10, corresponding to strategy A; the buyer's column maximums are 12 and 14, his minimax being 12. The game has no saddle point. What is more, if one player selects one strategy and sticks with it consistently, the other can consistently outplay the first. So, if the seller chooses strategy A to ensure a payoff of at least 10 utils, the buyer would naturally choose his strategy B to minimize his losses. But if the buyer sticks religiously to his B the seller can raise his payoff by shifting over to his strategy B and receive 14 utils for having done so.

FIGURE 15

BUYER SELLER	STRATEGY A _B	STRATEGY B _B	ROW MINIMUM
STRATEGY A _S	12	10	10
STRATEGY B _S	8	14	8
COLUMN MAXIMUM	12	14	

PAYOFF MATRIX: ZERO SUM GAME WITHOUT SADDLE POINT

Likewise, if the buyer chooses his strategy A in order to minimize his losses to 12, the seller can calmly play strategy A, win 12 instead of his row minimum of 10, and keep on doing so. In sum, the seller is sure he can win at least 10, while the buyer is certain he need lose no more than 12. But each may do better than their maximins or minimaxes by changing strategies in some chance way--that is, by mixing their strategies.

Without going into the details of deriving odds, suppose the seller decides to mix his strategies in the proportion of 3 strategy A to each strategy B. His average payoff if the buyer chooses his strategy A is $.75 \times 12 + .25 \times 8 = 11$; in other words, 3 times out of four (75% of the time) he will win 12 and 25% of the time he will win 8, averaging out to 11, which is of course superior to the 10 he would be sure of by playing strategy A all the time. The value of the game to the seller is thus 11 if he mixes his strategy in some optimum, but random way (3 to 1).¹⁰

The seller's strategy of three A to one B would yield similar results against the buyer's strategy B. In this case, the value of the game would be $.75 \times 10 + .25 \times 14 = 11$.

¹⁰He must use some chance device, of course, like playing strategy B each time he draws a spade from a deck of cards--otherwise, a pattern may emerge which would permit the buyer to predict when the seller would use B, enabling him to choose his strategy A and cut his losses to 8.

The buyer's best strategy in this game would be to mix his strategies evenly--one A to one B--according to some chance device like the toss of a coin. The value of the game to the buyer if the seller uses strategy A is thus $.50 \times 12 + .50 \times 10 = 11$; if the seller uses B, then the arithmetic would be $.50 \times 8 + .50 \times 14 = 11$ --an identical value to the seller's, of course, since the winnings of one are the losses of the other. And 11 is a smaller loss to the buyer than the minimum of 12 which would have been lost had the seller picked pure strategy A.

In games without saddle points, then, both sides gain by mixing their strategies in some optimum proportion.¹¹

So far it has been shown that solutions may be found in zero-sum games, when chance is a factor in the payoff matrix, and when mixed strategies may be required. But what has been learned is a way to present a state-trading situation, without a description of what actions are actually involved in each strategy, or what the elements of the payoff have been. Perhaps seller's strategy A is a long, involved sequence of steps, including threshold prices and quantities, quality levels, volume of ancillary services (like credit, freight, and insurance), mode of presentation of the package, terms of the transaction, timing, and so on.

¹¹For a simple way to compute odds in a two-strategy game, see: J. D. Williams, The Compleat Strategist (New York: McGraw-Hill, 1965).

Strategies for B may include the same or different items, in different proportions, sequences, etc. The payoff may be measured in terms of profits, strategic concessions, or political advantages. Yet although game theory cannot tell everything about a state trading situation, it nonetheless can clearly reveal the nature of the conflict situation somewhat better, and it is capable of providing determinate solutions to problems when all the elements are known.

Moreover, whether the game is (1) zero sum or non-constant, (2) pure strategies or mixed, (3) with or without a saddle point, one of the essential elements lies in the power position of the respective participants. The probability distributions required are, hence, subject to the ability of traders to increase his "chances" of a desired outcome. The method of solution can, therefore, be subrogated to the probability of an event which in turn is a function (to a large degree) of the powers of the state trading "players." Information is thus essential concerning their respective size, bargaining ability, strength of their need to sell or purchase the commodity in question or in essence--their respective power positions.

Probability and Power

One of the most important questions in a state trading situation is that of the probability of state trader A exerting his influence over B. In other words, A's power

can be measured by the probability of getting a certain strategy selected by B. Power in this context thus varies from many alternative interpretations available.¹²

In considering such a concept of power several dimensions can be identified:

(a) The base of power, i.e., the resources (economic assets, constitutional prerogatives, military forces, popular prestige, etc.) that A can use to influence B's behavior.

(b) The means of power, i.e., the specific action promises, threats, public appeals, etc.) by which A can make actual use of these resources to influence B's behavior.

(c) The scope of power, i.e., the set of specific actions that A, by using his means of power, can get B to perform.

(d) The amount of power, i.e., the net increase in the probability of B's actually performing some specific action X, due to A's using his means of power against B.

(e) The set of individuals over whom A has power. The extension of power, in other words.¹³

¹²In reality there are many concepts of power and many methods of measurement. The method described, however, is felt to better illustrate the case of state trading. Perhaps it is very close to Max Weber's definition of power as "the possibility of imposing one's will upon the behavior of other persons." See: Reinhard Bendix, Max Weber: An Intellectual Portrait (New York: Anchor Books, Doubleday and Co., Inc., 1962), p. 290.

¹³John Harsanyi, "Measurement of Social Power, Opportunity Costs, and the Theory of Two-Person Bargaining Games," Behavioral Science, VII, No. 1 (January, 1962). The same material may also be found in: Martin Shubik, ed., Game Theory and Related Approaches to Social Behavior (New York: John Wiley and Sons, Inc., 1964), p. 184. Note: footnote references are to the Shubik text.

As may be noted reference will be made to state

If these dimensions of power are known, the positions of government traders can be compared. For instance, an individual (state trader) has more "power" the greater are items (a) through (e). However, item (d), the amount of power, is the most significant for this paper's purposes. Moreover, item (d) is the only item that can be quantified as a "real" number; all the other listings are specific objects or actions. It is defined, after all, as a difference of two probabilities. And it may be regarded as a general measure of power, possibility including elements of other dimensions--for example, scope and extent of power.

Up to this point no mention has been made as to the possible costs involved. Hence, another dimension is needed:

(f) The opportunity costs to A of attempting to influence B's behavior, i.e., the opportunity costs of using his power over B (and of acquiring this power over B in the first place if A does not yet possess the required power); which we shall call the costs of A's power over B; and

(g) The opportunity costs to B of refusing to do what A wants him to do, i.e., of refusing to yield to A's attempt to influence his behavior. As these opportunity costs measure the strength of B's incentives for yielding to A's influence, we shall call them the strength of A's power over B.¹⁴

trading as if Harsanyi's article deals with government exchange. It does not. However, it offers a method of analyzing the bargaining procedure and is capable of application to the state trading case.

¹⁴Shubik, ed., Game Theory and Related Approaches to Social Behavior, op. cit., p. 186.

A's power over B therefore not only includes the ability of A to secure desired action from B with a certain probability, but also within a certain cost to A. These costs may be expressed in physical units, monetary units, or abstract utility measurements.

In addition, state traders A and B may have different views of costs. Nation A may be able to dominate B and force a certain act to be performed but only at a considerable expense relative to what costs nation B might incur to force a similar act in its favor.¹⁵ One way to measure power might be to hold costs constant in both countries and then compare the power or influence of the two nations which results. However, nations (or their respective governments) do not necessarily seek an objective from a "power-per-dollar" point of view. Thus one country's subjective evaluation of the goal may necessitate larger (or smaller) cost outlays compared to another's. And in the extreme, a nation may have limited resources to devote to a desired objective even though their evaluation would suggest the desirability of a larger commitment.¹⁶

Costs, then, are important. As the concept of opportunity costs implies, nation B must be aware of the costs involved in not complying (or agreeing) to nation A.

¹⁵Ibid., pp. 186-189.

¹⁶This point is especially significant when small and large nations mutually state trade.

That is, by not allowing A's strategy to dominate, B may undergo a cost of "noncompliance," and this will naturally influence B's decisions to comply or not comply with A's wishes. Moreover, state trader A can influence such opportunity costs in several ways. It may offer B certain advantages or disadvantages without any conditions attached; or nation A may offer possible rewards (or punishments) subject to conditions. And these results can be actual or real or they may be perceived (what B thinks they are).¹⁷ For instance, from A's point of view, the cost of influencing B may be "objective" costs (known from rational analysis), while B might be less rational and have only a vague idea of the costs of compliance or noncompliance.

In summary, then, it has been stated that a state trader's power over another can be thought of in terms of increases in probabilities of securing certain actions, conditioned by any costs incurred by A to influence B and by B of refusing to be influenced. But more can be said by defining the strength of power as Harsanyi does in (g) above (in terms of the utility B gives up if it refuses A's attempt to influence its behavior), and then relating this potential gain in utility for B to B's disutility of performing an action desired by A. As a result, the maximum increase in probabilities that A can influence B is

¹⁷That is, nation B may think the costs to be at one level when they are really quite different.

revealed. And this increase in probabilities is the maximum amount of power A can exert on B. In algebraic terms, if Δp is the increase in probabilities or amount of A's power, u is the utility gain for B from acceding to A's demands, and x the disutility to B of acceding or

$$\Delta p \leq \frac{u}{x}.$$

That is, A's power maximum is simply the ratio of B's utility gain to its disutility from carrying out the action.

Realistically speaking, however, such a measure of power would require theoretical probabilities; yet in state trading, nation B's behavior may be observed over a series of similar events in which B complied with A in some proportion of the times. Probability in this sense becomes empirical frequencies. B's behavior will yield disutility of various amounts in the observed events. B will tend, therefore, to comply with A in those cases when the disutility is smallest. It is also possible that if B increases his agreements with A, his disutility for compliance would increase as the more "distasteful" actions remained (as the less distasteful were selected first). As a result, the amount of A's power over B may increase somewhat less than proportionally over time if the number of possible actions are limited.¹⁸

¹⁸Ibid., p. 187-193.

The Zeuthen-Nash-Harsanyi Solution
for Bilateral Power Positions

Thus far, probability and power have been discussed as though only one player or state trader had power over the other. In general, however, both parties have power over the other. In the Zeuthen-Nash-Harsanyi general model of bilateral power situations, both parties' power functions are analyzed, i.e., each state trader's power function must be viewed simultaneously.

It was assumed earlier that nation A had attempted to influence nation B into performing an act-say Y.¹⁹ B, of

¹⁹The following symbols will be utilized in order of appearance:

- Y = act wanted by trader A
- y = disutility to trader B when performing act Y
- p_1 = probability of performing act Y
- s = mixed strategy
- $s(p_1)$ = mixed strategy with probability p_1
- $s(o)$ = mixed strategy with probability o, yielding smaller utility to B than $s(p_1)$
- u_1 = B's utility for $s(p_1)$ performance
- u_o = B's utility if using other strategy $s(o)$
- u_o^* = A's utility if B does not perform act Y
- y^* = increase in A's utility if B performs with a probability of 1
- Z = reward by A given to B for compliance to Act Y increasing probability to p_2
- $s(p_2)$ = mixed strategy with new p_2 probability (reward z included)
- z = gain to B for reward Z
- z^* = cost to A for Z reward to B
- u_2^* = A's expected utility with cost of reward Z and increased probability p_2

course, could realize a certain disutility (y) in complying yet would perform with a probability p_1 [or a mixed strategy, s , would be chosen with the probability p_1 or $s(p_1)$]. That is, $s(p_1)$ to B can be assumed to yield a higher level of utility than a refusal by B to comply to the act. Another strategy $s(o)$ would yield a smaller payoff u_o , rather than the higher payoff u_1 , for using the mixed strategy s with a probability p_1 or $s(p_1)$. B's total expected utility would thus be $u_1 - p_1 y$ greater than u_o [or B's utility for using his strategy minus the disutility associated with it would be greater than the utility gained when using another strategy $s(o)$].

u_2	=	B's expected utility with reward Z and probability p_2
D	=	sanction or damages imposed by A against B in an attempt to increase the probability of agreement
d	=	loss to B for sanction from A
d^*	=	cost to A for imposing sanction on B
u_3^*	=	B's expected total utility for A with sanction against B
V_B	=	B's expected total utility with sanction
V_A	=	A's retaliatory action against B
d	=	new total loss for B in conflict
d^*	=	new total cost for A in conflict
p_2^B	=	equilibrium probability for action Y for B
p_2^A	=	equilibrium probability for action Y for A
u_4^*	=	A's expected utility in a symmetric case
u_4	=	B's expected utility in a symmetric case
CA	=	complementary act to action Y if Y is not performed by B

If in the event that B did not conform to A's wishes, then A's utility would be lower, or u_0^* . However, if B conformed with a probability of one, A's utility would be larger by y^* . But in the event that the original probability p_1 existed, then A's expected utility would be $u_0^* + p_1 y^*$, or the sum of these new possibilities of performance and nonperformance.

Of course, in all bargaining situations, it is possible for rewards to be offered for the performance of an act. If player A now introduces a reward Z to B, B's probability of compliance could increase to p_2 . For instance, state trader A may offer certain political concessions to increase the probability of agreement. Again a new strategy is possible represented by $s(p_2)$. From a utility standpoint, the inducement Z added to B's utility while it represented a cost to A in satisfaction $\sqrt{\text{or a gain } z \text{ to B and a loss (cost) } z^* \text{ to A}}$. The reward now allows A's expected utility with the new probability (p_2) to be the sum of A's utility if B does not perform minus the cost of the reward plus the increase in utility arising from the new probability. Nation B's expected value would differ by the addition of the reward. Symbolically, for A:

$$U_2^* = U_2^*(p_2) = u_0^* - z^* + p_2 y^*$$

and for B:

$$U_2 = U_2(p_2) = u_1 + z - p_2 y.$$

If the opposite approach is utilized, i.e., sanctions A can impose a penalty, or damaged D, against B in an attempt to increase the probability of agreement. Such penalties could include lost political or military ties, loss markets, reduced orders, or other denied favors (or penalties) that A may restrict (impose) to (on) B. Again in utility standards, the penalty D to nation B would create a loss d, while A would incur a cost d^* by imposing the sanction. As with the rewards discussed previously, A's new expected satisfaction includes the utility if B does not perform minus the cost of the sanction plus the utility from the original p_1 probability. Player B's expected value would be the utility from the p_1 probability minus the sanction less the disutility when performing. Algebraically, A's expected utility with an "in doubt" p_2 would be $U_3^* = u_0^* - d^* + p_1 y^*$ while B's expected utility would become $U_3 = u_1 - d - p_1 y$. The assumption in this situation is that B would still retain his p_1 probability for performance (or that they could not agree on the value of p_2).

In more realistic cases of state trading, both parties usually have the ability to use retaliatory strategies and direct them against each other. In most trading situations, a passive participant is rare. Each trading party has its own unique "methods" depending on the interpreted value of the action. In addition, such action will be limited by the size and resources of each respective

nation. For instance, Russia while trading with smaller countries has been quite capable of securing advantages simply because of the sheer magnitude of her possible retaliatory actions.

Assuming these conditions to be present, nation A can use measure V_A and nation B may resort to measure V_B . If this situation arose, d would now become the total loss for B in a conflict, a cost accruing from B's own retaliatory strategy and the cost (loss) created by A's actions. For similar reasons, d^* would include both cost items for trader A.

Up to this point, no mention has been made of the actual probability p_2 , i.e., the equilibrium probability for action Y of the state traders. However, with all possible actions now presented, it is possible to find such a value. Obviously, it lies between the two nations' concession limits. A's concession limit is reached when the expected utility from those actions with rewards equals that expected utility with sanctions or damages. Or algebraically when $U_2^* = U_3^*$ and similarly when $U_2^* = u_1^* - z^* + p_2 y^*$ equals $U_3^* = u_0^* - d^* + p_1 y^*$. Solving these equations for the p_2 value for A gives $p_2^A = p_1 + \frac{z^* - d^*}{y^*}$. If the equilibrium probability p_2 equals p_2^A , then A's expected total utility will be $U_2^*(p_2^A) = U_3^* = u_0^* - d^* + p_1 y^*$ as before but now d^* includes retaliatory actions. Similarly, B's

expected total utility with the p_2^A value becomes

$$U_2(p_2^A) = u_1 + z - \frac{y}{y^*}(z^* - d^*) - p_1 y.$$

As with nation A, B's concession limit is realized when the expected utility from those actions with rewards equals that expected utility with sanctions or damages.

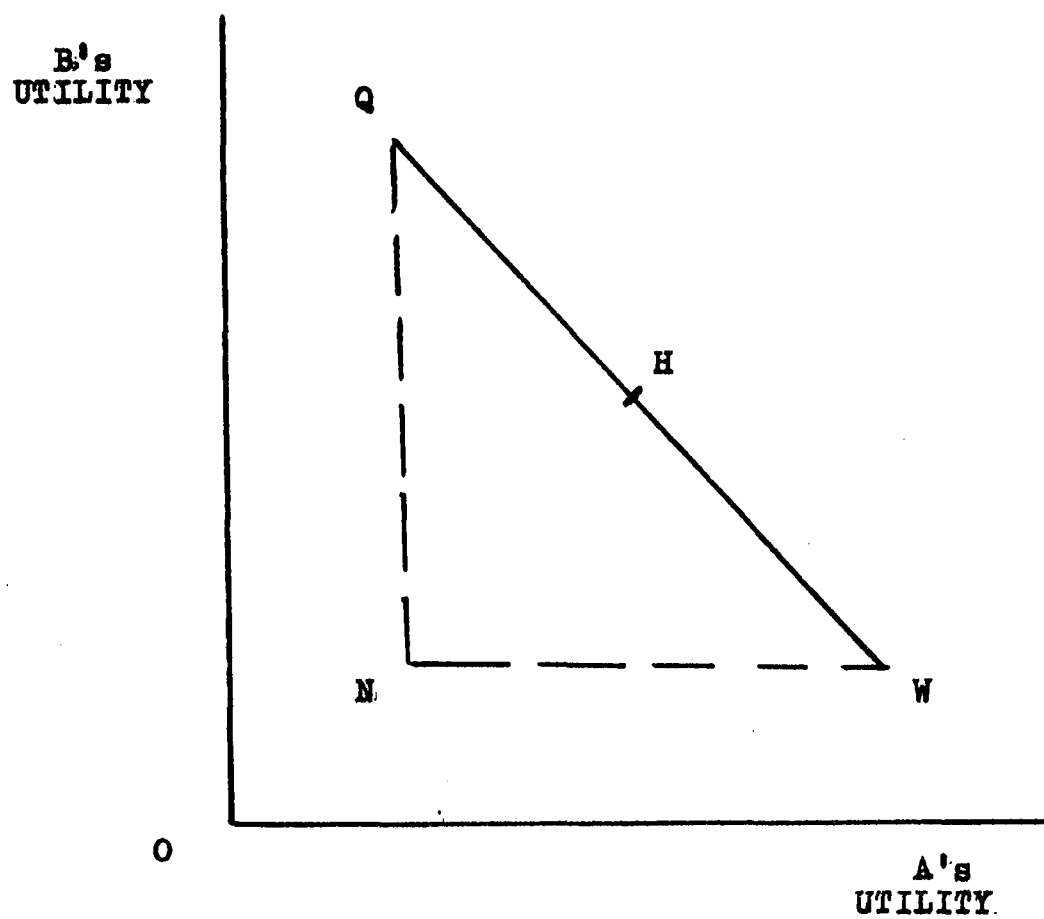
That is, when $U_2 = U_3$ giving the p_2 value for B of $p_2^B = p_1 + \frac{z + d}{y}$. Again with $p_2 = p_2^B$, B's expected total utility becomes $U_2(p_2^B) = U_3 = u_1 - d - p_1 y$. Similarly, A's expected utility with the p_2^B value becomes $U_2^*(p_2^B) = u_0^* - z^* + \frac{y^*}{y}(z + d) + p_1 y^*$.

When translated into a geometric figure in the form of a utility plane (see Figure 16), the total of agreement points lie on a straight line connecting the two traders' concession limits--points Q and W. Algebraically, in the plane (U^*, U) the agreement points are $U(p) = \angle U_2^*(p_2)$, $U_2(p_2) \angle$ with the concession limit points $Q = U(p_2^B) = \angle U_2^*(p_2^B)$, $U_2(p_2^B) \angle$ and $W = U(p_2^A) = \angle U_2^*(p_2^A)$, $U_2(p_2^A) \angle$. The payoff in conflict cases occurs at N with $N = (U_3^*, U_3)$.

If a further assumption is made that the agreement points (U) lie on the straight line QW, the solution, provided that the game is perfectly symmetrical between the players, falls halfway between Q and W--(or at H). Again algebraically, A's expected utility at point H equals

$$U_4^* = \frac{1}{2} \angle U_2^*(p_2^A) + U_2^*(p_2^B) \angle = u_0^* - \frac{z^* + d^*}{2} + \frac{y^*}{2y}(z + d) + p_1 y^*; \text{ while B's expected utility becomes } U_4 = \frac{1}{2} \angle U_2(p_2^A) + U_2(p_2^B) \angle = u_1 + \frac{z - d}{2} - \frac{y}{2y^*}(z^* - d^*) - p_1 y.$$

FIGURE 16



ZEUTHEN-NASH UTILITY PLANE

Setting $U_4^* = U_2^*(p_2)$ and $U_4 = U_2(p_2)$ the equilibrium value of p_2 consistent with the solution point H becomes

$$p_2 = p_1 + \frac{z + d}{2y} + \frac{z^* - d^*}{2y^*}.^{20}$$

In addition, trader A will attempt to select a Z value (reward to B) which will maximize the following:

$\Delta z = \frac{z}{y} - \frac{z^*}{y^*}$. By achieving such a maximum, A has the best Z as an incentive, minus the cost of providing this service to B. In a similar fashion, A will attempt to choose the penalty D to maximize the following: $\Delta d = \frac{d}{y} - \frac{d^*}{y^*}$. That is, A by maximizing the difference between the penalty value and its cost, adds to its power position.

In the more realistic case of both parties using their retaliatory strategies, A would attempt the above when B's retaliatory strategy is given. B, of course, would attempt the same type of maximization procedure given A's retaliatory strategy but would achieve it by minimizing Δd when A's strategy D_A is known. As a result of both parties' actions, the equilibrium choice of D_B and D_A will be of that value to allow Δd to be a maximum.²¹

As a consequence, B can select a strategy $s(p_2)$, the equilibrium probability strategy, which would allow the amount of A's power over B to be the difference in probability two minus probability one or $\Delta p = p_2 - p_1$. If A and

²⁰Ibid., p. 201.

²¹Ibid.

B agree from this to do act Y with the probability p_2 then B will not perform act Y with a probability of $1 - p_2$. Technically speaking, A and B have agreed on a jointly randomized mixed strategy with a probability p_2 of compliance for B and a $1 - p_2$ probability of noncompliance. However, noncompliance by B toward A measures B's power over A to perform a complementary action (CA) to action Y with a probability of $1 - p_2$.

Thus as noted, if B does not comply to A's wishes, A will perform action CA. If so, A will have lost the utility associated with compliance by B, or y^* . In other words, y^* now is a measure of disutility to A when forced to perform the complementary action CA. If (as shown above) the amount of A's power over B is $p = p_2 - p_1$ or $p = p_2 - p_1 + \frac{1}{2}(\frac{z+d}{y} - \frac{d^*-z^*}{y^*})$ then $(z + d)$ measures the sum of the reward for B for compliance plus the penalty for non-compliance. In reality, it indicates B's willingness to agree with A. It thus represents the conflict opportunity costs to B and hence the "total" strength of A's influence over B. Moreover $\frac{z+d}{y}$ measures A's "relative" strength over B.

In addition $(d^* - z^*)$ indicates the cost differential to A of a sanction against B and the cost of rewarding B. Similarly, (as with B) the difference measures A's willingness to agree with B. From A's point of view, it is his opportunity costs of conflict with $(d^* - z^*)$ measuring the

"total" strength of B over A and $\frac{(d^* - z^*)}{y^*}$ being the relative strength of B over A.²²

As pointed out by Harsanyi:

If both parties follow the rationality postulates of the Zeuthen-Nash theory of the two person bargaining game, then in bilateral power situations the amount of A's power over B with respect to some action . . . tends to be equal to half the net strength of A's power over B with respect to the same action . . . this net strength being defined as the difference between the gross relative strength of A's power over B with respect to action . . . and the gross relative strength of B's power over A with respect to the complementary action²³

More specifically, this applied model reveals the amount of power a state trader (A) may have over trader (B) under the given assumptions. It includes the possible rewards a nation may offer plus the possible penalties it may impose to force compliance to an act. At the same time it includes another force, that one of less submission in light of the concessions that B perceives A may have to make. The strength of these forces is the difference between the total relative strength of nation A over B relative to event Y, and the total relative strength of nation B over A with respect to a complementary event CA. Given the symmetry assumption (the same starting disagreement point), the amount of power would be equal to one-half of the differences of these two strengths. Symbolically,

²²Ibid., p. 203.

²³Ibid., p. 204.

it would appear as $\frac{1}{2} \left[\frac{(z+d)}{y} - \frac{d^*-z^*}{y^*} \right]$. That is, nation A's power over B equals one-half the rewards plus the penalties given to B by A divided by the disutility to B for performing (this is one strength or force); minus--the cost to A for imposing any damages or penalties on B minus the cost of any rewards given to B divided by the gain in utility to A if B performs with increased probability (1).²⁴ The greater the difference between these two forces, the greater will be the power of one state trader (A) over another (B).

In sum, the above system yields the following results: In the first instance, it provides an equilibrium probability for action under the described (limited) assumptions. Moreover, the presented solution is Pareto optimal for it lies on the boundary of the utility plane (see Figure 16) and is the best position for both players. In addition, symmetry was assumed, allowing for the determination of the equilibrium probability and utility. That is, the final solution had to lie within the confines of the utility plane with zero as the common origin (i.e., the same disagreement point) for both parties.²⁵

²⁴Of course, y^* has become a measure of disutility to A in conflict.

²⁵As may be surmised, the Zeuthen-Nash-Harsanyi solution is not the "only" theory of the bargaining process. However, its emphasis on power relationships made it more significant than most for state trading purposes. Though approaches may vary, the outcomes may be relatively close. As pointed out by J. Cross: "In view of these results, it

Power over another, therefore, depends on the strength of the individual (or nation) to influence or command compliance. The greater such strength the greater will be the scope and extension of power. Incentives for action include utility or disutility for performing, with greater power going to those willing to assume the costs depending on their interpretation of the value of the achieved event. By analogy to production theory, output is a function of the various inputs. With power, the ability to influence others is a function of the utility and costs borne in forcing compliance.

The Values Within the Payoff Matrix

It may be recalled that as the simple state trading model was presented, the solution was limited in its "description" of strategies. The Harsanyi procedure (when applied to state trading) provides a solution (with weaknesses) but it lacks the capability of divulging "all" influences on the selection of various strategies. The original model had these possibilities but as presented was

is not hard to surmise why international negotiations, where learning and discount rates are probably lower . . . expectations may be more optimistic, and bargaining costs are practically zero, can last for years, although for the same reason we would expect that the outcomes will be fairly near the Nash solution." See: John G. Cross, "A Theory of the Bargaining Process," The American Economic Review, LXVI (March, 1969), pp. 68-77.

incomplete. The following is aimed at supplementing the previous material by looking more deeply into the component parts of a strategy, i.e., into the values within a simple payoff matrix. More specifically, how may economic goals be reconciled with political or military or general prestige goals, and how are the overall values (including both economic and noneconomic elements) of the payoffs determined?

Just as Harsanyi made use of cost-benefit ideas in the development of his bilateral power position model, the cost-benefit approach may be employed in analyzing the trade-off between economic and noneconomic goals. Harry G. Johnson used essentially this technique in his explanation of why small countries often attempt to industrialize even though inefficiency will obviously result. According to Johnson, certain policy actions will be taken "up to the point where the value of the marginal collective utility derived from collective consumption of national power is just equal to its marginal excess private cost."²⁶ Later, B. J. Cohen modified the approach to explain the trade-off between consumption of economic goods and services on one

²⁶ Benjamin J. Cohen, ed., American Foreign Economic Policy (New York: Harper and Row Publishers, 1968), p. 18. See also: Harry G. Johnson, "An Economic Theory of Protectionism, Tariff Bargaining, and the Formation of Customs Unions," Journal of Political Economy, LXXIII (June, 1965), 256-283.

hand and the consumption of power (a political good) on the other. Cohen's formulation is especially helpful in the state trading case.

First, it is possible to define the real income of a country in terms of its total utility derived from its total consumption of economic goods and services together with its total consumption of national power. National power is defined so as to include military position, political advantages, international prestige, and so forth; it is thus a noneconomic end in itself, rather like a consumer good, as well as a means to both more economic goods and services (potentially) and more power. In the latter respect, national power serves as a type of noneconomic capital good, which can be used to raise real income in the future while serving as a noneconomic consumer good at the same time. It is, therefore, a direct noneconomic equivalent to economic goods and services, which are partly consumer goods and services and partly capital-type goods and services.

The potential total real income of a country is, in turn, determined by the volume and quality of resources (broadly defined) available. To some extent, national power and economic goods and services are mutually reinforcing parts of total real income--that is, the more goods and services available, the more potent the country may be in a political or military sense as well (and vice versa),

but only to a point. At some point, greater international power may require the sacrifice of resources: more men and material for arms production, perhaps, at the expense of domestic living standards, or more economic assistance for politically pivotal underdeveloped countries at the expense of domestic environmental improvement. When this point is reached, income maximization can occur only by means of a trade-off of economic goods and services for national power or vice-versa. To maximize real income, therefore, a country should trade off economic consumption of goods and services for national power as long as the marginal collective utility of consuming national power is greater than the marginal cost of foregone consumption of goods and services.

The United States and the Soviet Union are excellent polar cases of this trade-off phenomenon. In the U. S., a relatively high valuation is put on economic goods and services, and usage of resources for military buildups or foreign aid (which serve to enhance national power) is permitted only grudgingly. In the Soviet Union (at least until quite recently), high priority has been put on military expenditures, economic penetration of the underdeveloped countries, acquisition of high-technology goods from the West, and so forth, at considerable cost in terms of living standards. Obviously, these two countries formulate state-trading strategies quite differently--their payoff matrices are very different, and the makeup of each

matrix square is quite different, since their relative valuations of national power and economic goods and services vary so.

Cost-benefit analysis (or marginal analysis, if that is a better term), then, can help explain the composition of the values in a matrix--how much utility is derived from national power and how much from consumption of economic goods and services. Likewise, it can also be helpful in showing what the amounts are. Since a state-trading matrix is necessarily based on trade between two governments, it is only necessary to say that the amount of value (economic plus noneconomic) in each matrix square depends on the marginal contribution of imports to total real income or utility minus the cost to real income of foregoing those goods and services exported. Since different strategy combinations will yield different volumes and terms of trade (as well as different political concessions granted and received), the matrix values will also differ.

Perhaps a rough example may help clarify the foregoing. Suppose the U. S. is considering the negotiation of a trade agreement with the Soviet Union. Suppose further that the United States' strategy A amounts to a relatively generous (by past standards) offering of wheat, computers, and heavy equipment at attractive prices if the Russians respond with a relatively liberal strategy permitting U. S. firms to enter into co-production arrangements in the

U. S. S. R., to develop markets for U. S. products like Coca Cola, and to import sizable amounts of Soviet crude oil. On the other hand, strategy A may require the U. S. to supply only a small amount of wheat and accept only homogenized yak furs if the Russians adopt a relatively restrictive strategy. A liberal response may well yield a much higher increment to U. S. real income, since enlarged sales and production of "comparitve advantage" goods coupled with increased power over the Soviets stemming from their increased dependence upon this country could be expected to substantially outweigh the economic and political costs of foregone wheat, computers, heavy equipment, and dependence upon Russian oil and markets. A restrictive response by the Russians would not cost so much, but neither might the net benefits be more than incidental, with a correspondingly low matrix value.

In conclusion, this chapter has dealt with game theory as applied to the state-trading situation. Initially, a simple two-person zero-sum game was hypothesized to indicate the nature of game theory as an analytical tool. This was then expanded, using the Zeuthen-Nash-Harsanyi approach, to permit power positions to enter the state-trading calculus. Finally, cost-benefit analysis was employed in an attempt to show how both economic and non-economic considerations may enter into the determination of state-trading payoffs. Although game theory may not be

able to offer a determinate solution to the real-world policymaker, it nonetheless offers a unique view of the state trading situation, emphasizing the importance of conflict, of benefits and costs, and of power and probabilities. Game theory may not be especially useful as a predictive device, therefore, but does appear to have useful explanatory powers inasmuch as it, more than any other approach, gets to the root of the basic nature of state trading--conflict.

CHAPTER VI

STATE TRADING IN WHEAT

It has been shown that state trading can take many forms, employ both economic and political measures, and have some far-reaching consequences. The preceding chapter suggested that game theory may have some useful applications to state trading situations, perhaps more in the way of helping to understand why state traders behave as they do than in any predictive sense. As a tool of analysis, game theory thus may be somewhat comparable to the kinked oligopoly demand curve: it tells us something about the nature of an economic situation, but it cannot really tell us much about how that situation came to be in the first place. Game theory merely offers a method of analyzing the outcome of a bargain or transaction, which may nonetheless be of considerable value. This chapter explores just such a deal--the Soviet Union's purchase of wheat from the United States in 1972.

The Wheat and Food Aid Treaty

In order to understand and truly appreciate the Soviet-American wheat deal, it is first necessary to examine briefly several aspects of U. S. agricultural policy which

appear to operate as "external restraints" on the American side.¹ It is commonly known that the United States has a complex set of policies and regulations concerning the production and distribution of its grain products. Nor is the U. S. alone in such practices--many other nations also supervise their agricultural activities for both external and internal reasons.

In addition, the United States is a member of an international wheat agreement which has been renewed and modified over the years until it reached its present form in 1971.² Under this agreement, member countries report to a "Wheat Council" and "Secretariat" those of its activities which govern the production and sale of wheat in its domestic markets. The Council and Secretariat then use this information to monitor world wheat prices and market conditions and make whatever recommendations seem necessary to maintain stability in these markets.

Of course, stability in prices ideally requires some reference point from which to measure changes. Prior

¹Of course, only those activities and regulations concerning state trading (of the nearly infinite number of agricultural regulations) are examined. Other regulations are dealt with only as they apply to the various aspects of the Soviet deal.

²United States Congress, International Wheat Agreement, 1971, Hearings before the Ad Hoc Subcommittee on International Wheat Agreement of the Committee on Foreign Relations, United States Senate, on Executive F, 92nd Congress, 1st Session, June 15, 17, and 29, 1971 (Washington, D.C.: Government Printing Office, 1971), p. 1-3. The agreement will last until July, 1974.

to the 1971 extension of the agreement, the U. S. had hoped that one standard type of wheat would be adopted--the top quality wheat in the world, Manitoba No. 1 at a price of \$1.62½ at Lakehead ports--and that all other wheats would be pegged against it. However, for several reasons agreement could not be reached on this matter in the 1971 extension. For one thing, Canada was in the midst of installing a new grading system for wheat, and secondly, neither Canada nor the U. S. was willing to have one of their grains adopted as the reference wheat. Therefore the final agreement--without a reference wheat--also lacked a reference price.³ This meant that the 1971 wheat agreement, unlike its predecessors, had neither an agreed maximum nor minimum price (setting a range within which world prices would float).

The Soviet-American Wheat Deal

Given these world wheat pricing conditions--flexible ones, to say the least--the stage was set for the

³This point will have significance when examination of the Soviet wheat deal is made.

At this point it may be beneficial to note that as part of the international wheat agreement, a food aid agreement was also signed. Under its terms, the U. S. (only one of 31 nations--including the U.S.S.R.) agreed to donate to "needy" nations a sum of wheat according to its capability to produce wheat. Of course, the U.S., being the largest producer in the world, was allocated the largest share. Contributions are made under Public Law 480 and are given out of Commodity Credit Corporation stockpiles. The U. S. donation amounts to 1,890,000 metric tons each year over the life of the three-year agreement.

Soviet-American wheat transaction. In December of 1971 information was received by the U. S. government concerning Soviet difficulties with grain production. Bad weather and crop failures had plagued the Russians, forcing them to turn to international markets to meet their grain needs. In April of the next year, Secretary of Agriculture Earl L. Butz led a trade mission to Moscow and conducted the beginning discussions. Two months later, on July 8, 1972, President Nixon announced that agreement had been reached on the sale of grains to Russia.⁴

Behind the scenes, however, the negotiations were conducted in two distinct segments. In June, a Soviet delegation arrived in the United States prepared to purchase various grains specified in the Moscow meeting in April. However, the delegation consisted of two distinct groups. Private negotiations took place between part of the delegation and eight large American grain exporting firms while government negotiations on credit arrangements were handled by the rest of the Soviet representatives with the U. S. government. On July 8, final agreements had been reached on both parts of the grain sale. At this point, however, neither the type (or types) of commodity (or commodities), nor their volumes, were stipulated in the

⁴"All About That Soviet Wheat Deal," U. S. News and World Reports, LXXIII (October 9, 1972), 28-30.

agreement or publicly disclosed--the specifics would be determined at some future date.⁵

It was not until one month later that the Russians announced their intentions to purchase wheat only, excluding other grains that had been previously considered. As a result of the announcement, the wheat market responded vigorously, with domestic prices rising from \$1.65 per bushel in June to \$2.27 by late November. Of course, along with the domestic price increase, U. S. export subsidies also rose.⁶

At this point, it may be helpful to review U. S. export subsidy policies relating to the wheat deal. Basically, the U. S. Department of Agriculture's export subsidy is a discretionary "tool" resting with the Secretary of Agriculture. It is designed to ensure the "competitiveness" of U. S. wheat in world markets.⁷ In addition, the subsidy may be used to stabilize world wheat prices, to aid price-support programs by strengthening domestic market prices, and to reduce the quantities of wheat the Commodity

⁵United States Congress, House of Representatives, Sale of Wheat to Russia, Hearings before the Subcommittee on Livestock and Grains of the Committee on Agriculture, 92nd Congress, Second Session, September 14, 18, and 19, 1972 (Washington, D.C.: Government Printing Office, 1972), pp. 1-5.

⁶Ibid., pp. 5-15.

⁷In recent years U. S. wheat prices have been above world prices. Export subsidy payments are made to bridge the gap between higher domestic prices and world selling prices.

Credit Corporation (CCC) must purchase to maintain domestic prices at their support levels.⁸

Prior to the wheat sale of 1972 the subsidy rate was very low. It was determined daily by USDA officials, and set at levels high enough to ensure the competitiveness of U. S. wheat in world markets. To receive a subsidy, an exporter had to apply for it and offer to export a certain quantity and quality of wheat from a specific port.⁹ If the application was accepted by the Agriculture Department, the subsidy was fixed at that day's rate (regardless of when the wheat was actually shipped). Payment of the subsidy was then made by the CCC after proof of shipment was presented to them.

Naturally, after the Soviet grain deal was publicized and domestic prices began to rise substantially above world prices, the export subsidy rate soared. Table 4 shows the U. S. export subsidy rates and domestic prices for wheat for those months immediately after the announcement of the deal. Of special interest is the period between

⁸United States Congress, United States Senate, Extension of Farms and Related Programs, Hearings before the Committee of Agriculture and Forestry, 93rd Congress, 1st Session, February 27, 28; March 1, 2, 8, 9, 13, 14, and 20, 1973 (Washington: D.C.: Government Printing Office, 1973).

⁹The exporter does not necessarily have to have orders for wheat but may be contemplating a shipment . . . or he may be trying to take advantage of that day's favorable export subsidy rate!

TABLE 4

U. S. EXPORT SUBSIDY RATES AND PRICES FOR HARD RED WINTER WHEAT
FOR THE PERIOD OF JULY 1 TO SEPT. 25, 1972
(Per bushel)

Date	Delivered shipboard At U.S. port (Domestic Price)	Export subsidy rate	Export target price ("World" Price)
1972			
July 3	\$1.68 1/4	\$0.05	\$1.63 1/4
5	1.69	.06	1.63
6	1.71 1/2	.07	1.64 1/8
7	1.69 7/8	.07	1.62 7/8
10	1.71 7/8	.09	1.62 7/8
11	1.76 1/4	.13	1.63 1/4
12	1.76 1/2	.13	1.63 1/2
13	1.76 1/2	.13	1.63 1/2
14	1.73 1/4	.10	1.63 1/4
17	1.74 1/4	.11	1.63 1/4
18	1.76 7/8	.13	1.63 7/8
19	1.79 1/4	.15	1.64 1/4
20	1.77 5/8	.14	1.63 5/8
21	1.76 1/4	.13	1.63 1/4
24	1.78 3/4	.14	1.64 3/4
25	1.79 1/8	.15	1.64 1/8
26	1.77 7/8	.14	1.63 7/8
27	1.76 5/8	.13	1.63 5/8
28	1.78	.14	1.64
31	1.79 3/4	.16	1.63 3/4
Aug. 1	1.80 1/2	.16	1.64 1/2
2	1.80 3/4	.17	1.63 3/4
3	1.88	.21	1.64
4	1.95	.31	1.64
7	2.05	.31	1.74
8	2.04	.31	1.73
9	1.96 1/4	.31	1.65 1/4
10	2.02	.36	1.66
11	2.04 3/4	.36	1.68 3/4
14	2.05	.36	1.69
15	2.02 3/4	.35	1.67 3/4
16	2.04	.36	1.68
17	2.08	.38	1.70
18	2.10 1/4	.38	1.72 1/4
21	2.10 1/2	.38	1.72 1/2
22	2.11 3/4	.38	1.73 3/4
23	2.14 1/4	.38	1.76 1/4
24	2.12	.38	1.74

TABLE 4--Continued

Date	Delivered shipboard At U.S. port (Domestic Price)	Export subsidy rate	Export target price ("World" Price)
1972			
Aug. 25	\$2.09 3/4 .47	\$0.38 1.62 3/4	\$1.71 3/4
28	2.10 1/4 .47	.37 1.63 1/4	1.73 1/4
29	2.13 1/4 .47	.35 1.66 1/4	1.78 1/4
30	2.14 1/4 .47	.32 1.67 1/4	1.82 1/4
31	2.12 .47	.30 1.65	1.82
Sept. 1	2.17 1/4	.30	1.87 1/4
5	2.18 1/2	.30	1.88 1/2
6	2.17 1/4	.30	1.87 1/4
7	2.17 1/8	.29	1.88 1/8
8	2.18 3/8	.30	1.88 3/8
11	2.21	.29	1.92
12	2.27	.28	1.99
13	2.25 1/2	.26	1.99 1/2
14	2.29 3/4	.25	2.04 3/4
15	2.38 1/8	.25	2.13 1/8
19	2.46 1/2	.21	2.25 1/2
20	2.40 1/4	.19	2.21 1/4
21	2.39 3/4	.14	2.25 3/4
22	2.43 5/8	.00	2.43 5/8
25	2.39 1/2	.00	2.39 1/2

Source: United States Congress, United States Senate, Extension of Farm and Related Programs, Hearings before the Committee on Agriculture and Forestry, 93rd Congress, 1st Session, February 27, 28; March 1, 2, 8, 9, 13, 14, and 20, 1973 (Washington, D.C.: Government Printing Office, 1973), pp. 753-54.

August 25 and August 31. During that one week, the Agriculture Department, having decided to phase out subsidies altogether, adopted a so-called "two-tier" export payment system. In fairness to U. S. exporters who had previously made commitments to sell wheat around the \$1.63-\$1.65 target ("world") price range through 1973 on the assumption that the subsidy program would continue those targets, the Department offered--for one week only, from August 25 to 31--an export subsidy rate of either 47 cents per bushel (using target prices in the range of \$1.62 to \$1.67) or a lower rate, which actually ranged from 30 to 38 cents (using target prices in the \$1.71 to \$1.82 range).¹⁰ This 47 cent rate was offered on all prior or present sales or commitments made at prices based on the assumption that subsidies would continue. So, naturally, exporters all signed up for the higher subsidy rate, making it a one-tier system, in effect.¹¹ No doubt some exporters with prior commitments were bailed out by this action, and no doubt others were able to profit nicely by selling their wares abroad at prices considerably above that week's artificially low target prices.

¹⁰The target price is the one set by Agriculture Department officials to ensure "competitiveness" in world markets and, of course, to control domestic quantities at the same time. It also determines, along with domestic prices, the amount of export subsidy to be paid.

¹¹Extension of Farm and Related Programs, p. 737.

Why did the USDA decide to phase out the export subsidies? The steep increase (from 5 cents in July to 38 cents in August) in the subsidies certainly was one reason. Also, the Department's export goals had generally been met, and world wheat prices were on the rise, anyway. A cynic might say that, having seen how the Russians were able to profit from the subsidies, the USDA decided it was in for heavy criticism and moved to cut off any other would-be buyers who might be interested in sharing in the largesse.

It was noted earlier that the U. S. government was arranging credit terms with the Russians while the private exporters were negotiating the sale itself. In effect, then, the agreement signed on July 8, 1972 was not a sales agreement between the United States and Russia. It was really only an agreement on the amount of credit to be extended by the Commodity Credit Corporation to the Soviet purchasing agency.¹² Basically, a credit limit was established of \$750 million to be used over a three-year period. No limit was set on the amount or types of grains to be purchased, nor were minimums set. The only requirement was that no more than \$500 million of CCC credit be outstanding at one time.¹³ Under normal CCC arrangements,

¹²In addition, deliveries could be made to other Eastern European nations!

¹³Extension of Farm and Related Programs, Hearings, p. 747.

a three-year maturity period is allowed at an annual interest charge of 6.125 per cent.¹⁴ These terms were extended to and accepted (reluctantly, or so it seemed at the time) by the Russians.

The Cost and Benefits of the Deal

It thus appears that the type(s) of state trading practiced during the wheat sale consisted not of one form, but two. The Soviet state trading agency made its arrangements on credit with the U. S. government (state trader to state trader) and arranged the sale itself with private U. S. exporters (state trader to private trader). Moreover, within both deals certain costs and benefits can be identified which can help illuminate motives and strategies which will be of interest later when game theory is taken up in more detail.

Foremost among the many possible benefits resulting from the deal was the income received from the sale of the wheat, which depended in part on the price. Most government representatives (such as the Secretary of Agriculture) guessed that the privately negotiated price was very close to the U. S. target price range of \$1.63 to \$1.65. However, as the actual arrangements over price were made with private

¹⁴U. S. Department of Agriculture, P. L. 480 Congressional Sales, Foreign Agricultural Economic Report No. 65 Economic Research Service, September, 1970 (Washington, D.C.: Government Printing Office, 1970), pp. 10-15.

traders, no exact price information was disclosed publicly. In addition, under the export subsidy program, receiving a subsidy does not require a price to be revealed. Instead, the difference between the U. S. target price and the domestic price is used as the basis for the subsidy. However, since the negotiations were conducted in the June-July period during which the domestic price level approximated \$1.69 with export subsidies of around seven cents, it is probable that the negotiated prices fell very close to U. S. target prices.

Even at these prices, various U. S. benefits are subject to identification, if not precise measurement. Obviously, American wheat dealers were the direct recipients of Soviet outlays. In addition, as increased demand drove up American domestic wheat prices, farmers' incomes increased substantially (in accord with the goals of U. S. farm policy). However, the agreed-upon selling price, it has been argued, was quite low relative to what it could have been. Farmers who had sold their wheat before notice was given of the deal were naturally quite upset at the lost revenue they "could" have had, given information about the size of the sale. Agricultural Department officials, however, have argued that they did not know the magnitude of the Russian wheat purchase themselves. According to Secretary of Agriculture Butz:

We do know that Soviet buying agents were in New York during the first week of July. But any contacts they made at that time were with trading firms--not with us. And of course, the purchases were made from private sources and not from the U. S. Government. This is long established policy, fully in keeping with the American free enterprise system and with repeated congressional directives and policy statements.

I emphasize that nobody knew then--neither the Department of Agriculture nor the trade--just how much the Russians would buy. The export traders were not telling each other how much the Soviets were booking with them. The exporters did not tell the Department of Agriculture. Nor were the Russians talking.

It is accurate to say that the eventual size of the Soviet purchases caught everyone by surprise, including the Russians themselves. Soviet grain purchasers were in this country dealing with the private export trade in July and went home. Unexpectedly, they came back in a few days--apparently after getting a further assessment of the damage that had been done to their wheat crop by the hot, dry weather.¹⁵

It is apparent from the above, therefore, that the American farmer gained substantially from the deal. However, it can also be contended that they could have made greater gains with more information while the deal was being negotiated.

Similarly, benefits went to the dealers handling the grain because of the CCC's export subsidy setup. Depending on what future subsidy rates are expected to be, an exporter may register immediately or delay registering for a particular subsidy rate. According to E. B. Staats, Comptroller-General of the U. S.:

¹⁵Sale of Wheat to Russia, Hearings, p. 7.

The speculative aspects of the subsidy registration system are illustrated by five examples, CCC will pay exporters subsidies totaling about \$604,493, whereas had the exporter registered on the sales dates the subsidies would have totaled \$268,188 or \$318,305 less.¹⁶

If benefits are measured by extra income to such dealers, it can be argued that the CCC arrangements allowed some traders to benefit, albeit at a cost to the American taxpayer. This, of course, may or may not mean a net gain to the U. S. as a whole. All we can say is that some income redistribution resulted.

For similar reasons, beneficiaries of the sale included those industries and organizations related to the movement of wheat--trucking, rail, and barge lines, as well as those engaged in ocean shipping.¹⁷ Perhaps of more importance, though, was the impact of the wheat sale upon the U. S. balance of payments. Approximately one billion dollars in earned revenue has emanated from the transaction. And the CCC itself has saved another estimated one-half billion dollars from reduced storage costs and farm subsidy payments.¹⁸

In sum, then, it is possible to identify several quite tangible benefits to the U. S. from the wheat sale.

¹⁶Extension of Farm and Related Programs, Hearings, p. 390.

¹⁷It has also been argued that some high officials used their inside information for personal gain. However, these have been unsupported claims.

¹⁸Sale of Wheat to Russia, Hearings, p. 8.

Perhaps one of the more subtle economic benefits is the overall improvement in economic efficiency commonly associated with the expansion of industries which have notable comparative advantages (which the wheat-growers of the U. S. are ordinarily presumed to have) and the added pressure this puts on other industries via competition for factors and so forth. Additionally, since added exports usually translate into added imports at some point in time, there are important consumption gains, as well as competitive pressures on import-competing industries to make better use of their inputs.

Furthermore, it is likely that various political or less tangible (in the sense that they are not easily measured) benefits accrued, as well. For example, it is likely that the transaction assisted in building the "detente" or accommodation with Russia that the U. S. government had been seeking. To the extent that such undertakings reduce tensions and anxieties, head off wasteful arms races and the like, welfare in the total sense is clearly increased. It may also be that the wheat deal constituted part of the pressure the U. S. was putting on the Soviet Union to limit its assistance to North Vietnam and to counsel de-escalation in that conflict. Some political observers also feel that closer ties between the U. S. and Russia help keep a wedge driven between Russia and Red

China--the enemy disunited, in other words. Still others believe that U. S. trade with Russia is beneficial in serving notice to our European allies that they cannot take this country for granted, thereby making them more pliable in NATO negotiations, GATT and IMF negotiations, and so forth.

It might even be argued that the U. S. reaped an important international prestige gain by presenting the world with the image of a well-fed capitalist nation marketing its surplus food to a hungry country that just happens to be the "showcase" of world communism. It may have been good public relations, in other words.

Yet the sale did not develop without some quite large cost factors that must also be considered. As noted earlier, the price agreed upon for wheat was undeniably low, considering world supply and demand conditions at the time of the sale. Several months prior to the Soviet-American agreement, Canada had sold a large volume of wheat to Russia. After the sale, Canada withdrew from international wheat markets fearing possible domestic shortages in light of recently increasing production problems. Similarly, many European and Asian countries were encountering potential supply problems. The most potent factor, however, was that the U. S. export subsidy program, as exporters saw it, was supposedly to continue. During negotiations with the Russians, therefore, prices

were set with the assumption that governmental support for target prices would continue. Under these conditions, exporters felt that they could afford to sell at approximately \$1.63-1.65, knowing that any difference in export market prices and domestic prices would be made up by subsidies. The stage was set. Skillful Soviet negotiators, having done their homework, arranged for a deal which, according to the real supply and demand conditions, could have been at much higher prices. Assuming an inelastic Russian demand for U. S. wheat, potential income was thereby lost to American interests. This is a definite "cost" of the deal in the opportunity sense.

Additionally, it should be noted that the magnitude of the wheat sale severely disrupted the markets of American products using wheat. In the later months of 1972, wheat prices rose to levels more than 80 cents above pre-Soviet sales peaks. Quite obviously, wheat users suffered additional cost burdens (and lost consumer surpluses) which eventually pushed up prices for products such as bread. Other grain products which were substitutes for wheat also rose in price. These generally higher food prices, of course, also tend to raise living costs, money wages, and contribute to general inflationary pressure from the cost side.

Another costly result of the sale was the tremendous bottleneck that developed in those transport industries

charged with moving the wheat. Complicating the matter was the fact that the U. S. economy was gaining momentum and approaching full employment by late 1972.¹⁹ This placed still more strain on rail lines, barge lines, and international shipping firms. As in most such cases, the quality of services also deteriorated as costs rose.²⁰

There were undoubtedly political and prestige losses stemming from the wheat deal, too. There is some evidence that the thaw in U. S.-Chinese relations stalled somewhat as U. S.-Soviet relations warmed up. There was also angry reaction in Europe from allies who felt that U. S. "friendship" with Russia was coming partly at the expense of U. S. ties with Europe. Other wheat-exporting countries were understandably unhappy with the transaction, as were grain-exporting countries in general. Poor countries which had come to depend on cheap U. S. wheat financed by Public Law 480 moneys were hurt as prices rose. And many diplomats feared that U. S.-Soviet cooperation might expand to the point where the two superpowers might join forces to exploit less powerful countries both politically and economically.

¹⁹"Grain Strain: Shipping U. S. Wheat to Russians Burdens Transportation Systems," Wall Street Journal, CXC (October 18, 1972), 1.

²⁰These costs and benefits have been discussed from the American point of view. Russia's costs and/or benefits will be dealt with in a later section.

Finally, in weighing costs and benefits a distinction must be made between gains or costs to the U. S. economy as a whole and gains or costs to a particular sector. Overall gains depend on the weighted sum of the various benefits minus any costs to society. Individual gains obviously occur only to certain groups. It is possible to argue, for example, that the present administration was in favor of the deal because it wanted to redistribute incomes toward farmer and exporters at the expense of others, even though the nation as a whole might suffer from the exchange. Or from another perspective, the combination of satisfied farmer and exporters, reduced cold war tensions, and so forth may have in total outweighed any disutility to the unhappy consumers and taxpayers. In either and all interpretations, separation of individual and/or societal gains must be made.

It may be noted that the benefits and costs of the credit arrangements made with the Russians have not been explicitly discussed. Fairly obviously, these arrangements were made primarily to permit the grain sale to be made--that is, they were basically passive or accommodating in nature. It is not likely that a great hunger for interest income prompted the U. S. government to make the financing available, nor does it appear that the Russians enjoy indebtedness to the U. S. at capitalistic interest rates. The costs to the U. S. might include whatever added financial

market or inflationary pressure which may have resulted, as well as some foregone or postponed investment activity. The costs to the Soviet Union would include the interest charges themselves, and perhaps a prestige loss from having to borrow in order to finance necessities, as well as other possible internal financial problems connected with distribution and repayment.

State Trading and Game Theory Applications

The preceding section was intended to offer some insights into the nature of the wheat deal and suggest some of its resulting costs and benefits. However, several unanswered questions remain concerning additional motives and strategies of the sale, the applicability of the comparative costs doctrine, and the applicability of game theory.

First, the sale involved two of the four possible types of transactions. In one case private merchants sold to a Soviet state trading agency. In the other, governments dealt with each other over credit arrangements. Obviously, the motives for action in both instances varied.

In the first case, where private U. S. merchants negotiated sales with Soviet governmental buyers, several objectives can be postulated. For the U. S. exporters, profits were no doubt of primary importance. It was noted earlier that most of the sales were within the \$1.63-1.65

range, which was consistent with then-current prices in world markets. However, negotiated prices could conceivably have been at higher levels with complete knowledge of Soviet demand and world supply conditions. The motive of the private traders was thus most likely profit, but subject to a "knowledge" constraint. This was pointed out by Secretary of Agriculture Butz in response to a question during Congressional hearings:

Mr. Findley: Would you give us some insight as to what that means to a private trader in this country in attempting to negotiate a major deal with either China or the Soviet Union? If he is up against a state trader, what are the hazards that he has?

Secretary Butz: Well, if he is up against a state trader, he has no firm idea what his total intentions are, what his total program likely will be. If he is up against a competitive situation, you have some basis for more public information than if you are up against a situation where the decision is made at the top of the hierarchy and filters down through.²¹

On the Soviet side, even given some degree of monopsonistic power, the sole motive of profit (purchases at lowest possible prices) cannot be so easily assumed. The objectives of the Soviet Union, as with all government traders, are usually complex, varied, and secret. But it is quite obvious that the main goal of the Russians was the simple securing of badly needed wheat. Soviet crops had been adversely affected by an extremely severe winter;

²¹Sale of Wheat to Russia, Hearings, p. 34.

Eastern European countries were similarly affected; and prior Soviet purchases had been made from Canada, Australia, and France. Under these conditions, and coupled with a shift in Soviet import policy (placing higher priority on consumer demands), the Soviet bargaining position was anything but favorable. Yet, through skillful negotiation and bulk purchases, significant advantages were gained. It can only be conjectured at this point, but other Soviet motives probably included better relations with the U. S. (perhaps due in part to fear of China), the opening of future markets and sources of vital, high-technology machinery, a desire for access to more consumer goods, or any number of other possible undisclosed objectives.

Likewise, the negotiations over credit terms (state trader to state trader) are subject to the same type of interpretation. That is, each government had its own motives for action. For the Russians, financing was probably necessary, given its shortage of convertible foreign exchange and the necessity of having the wheat.

But why did the U. S. enter into both the sale and the financing arrangements? At first glance, expanded exports prompted by balance-of-payments difficulties appears to have been a strong motive. In addition, it has been a policy of the Nixon Administration to improve relations with many nations formally held in "ill repute." Moreover, the Soviet Union offered a large market for American goods

and offered many more potential imports (oil, minerals, and so forth). Under these circumstances, expansion of trade was inevitable. The wheat deal was only one of many possible avenues.

The sale itself, however, appears to have been arranged with very specific intentions. The private market was used exclusively to supply the commodity. No Commodity Credit Corporation stocks were to be involved. Export subsidies were paid, but were more than offset by reduced crop subsidy income payments to the farmers and savings in storage costs to the CCC. As a result, farmers' incomes rose, crop surpluses were reduced, and fewer controls were placed on crop production--and all are goals of U. S. agricultural policy. In addition, the credit arrangements, although favorable to the Russians, were made in part on the assumption that negotiations would continue on Russian lend-lease debt, high seas shipping problems, and ending the Viet Nam conflict.²² In sum, the objectives were quite specific, economic and political in nature, and conditioned by possible future arrangements.

To the broader question of whether the sales accorded with comparative advantage, the answer is more illusive. For years it has been argued that the greatest comparative advantages of the U. S. were in capital goods and

²²Sale of Wheat to Russia, Hearings, p. 25-26.

manufactured products. The question arising today, however, is to what extent the U. S. in fact may have a comparative advantage in agricultural production. However, due to the many regulations and controls over farm production and prices, it is difficult if not impossible to correctly assess the situation. That is, due to U. S. participation in various commodity agreements (for example--the previously described International Wheat Agreement) and domestic regulatory policies, "true" output and price levels are difficult to determine. It can be stated, however, that the sale has forced some relaxation of control over land use and output levels (additional supplies are desired). The deal thus may have "pushed" the U. S. more into an area of comparative advantage with a resulting more efficient use of world resources.

Several observations regarding the applicability of game theory to the wheat sale and the credit arrangement now appear in order. The game(s) can under certain conditions be said to be "zero sum" (the losses of one equal the gains of the other). The players (Russia, the U. S. government, and private traders) each gained (gave up) or lost (gained) from the trading partner. The export of wheat from the U. S. equaled the imports received by Russia, the price paid by Russia equaled the price received by the U. S., the loss of possibly higher prices to U. S. farmers equaled the saved cost to the Soviet Union, and the

concessions in credit by the U. S. equaled those gained by Russia. From an alternative position, however, it can also be argued that the game(s) was (were) not zero sum. Certainly the higher prices of wheat and wheat products in the U. S. as a result of the deal were not "direct" gains to the Soviet Union. Nor can production, employment and consumption effects be counted as equal losses or gains to each party. However, whether gains or losses are measured by the deal itself (zero sum) or whether all the end results of the exchange are included (non zero sum), game theory can help reveal many interesting elements of the transaction. In the discussion to be taken up shortly, a non zero sum assumption is made.

Similarly, the degree of ignorance on the part of each trader can be questioned. Neither side had much real knowledge of the other's motives or expectations in either "game." This was especially true of U. S. farm interests and partially true for Soviet dealers in the wheat sale transaction in that "it is accurate to say that the eventual size of the Soviet purchases caught everyone by surprise, including the Russians themselves."²³ Technically speaking, therefore, the strategies were not known in total to all sides. Under these circumstances, the game(s) can be classified (depending on the above conditions of

²³Sale of Wheat to Russia, Hearings, p. 7.

interpretation) as having complete or incomplete information and being zero or non-zero sum in payoff.

In the case where the U. S. government faced the Soviet government (state trader to state trader), it is equally possible to argue that in an "opportunity" sense the same was zero sum. Profit or prestige loss equaled that gained. Moreover, each government could have conceivably (beforehand) calculated the various strategies available to itself and its trading partner (complete knowledge). In turn, depending on the preferences and desires of each country, the strategies would yield varying amounts of utility. As we saw earlier, such desires or objectives were varied (for example--future expanded trade, increased supplies of wheat, better international relations, fear of third parties, and so on). They were in fact, blends of political and economic preferences. Profit maximization may or may not have been exclusively considered. Hence the resulting utility to each trader can only be assumed to be at a certain level and of a cardinal scale, for simplicity's sake.

Be that as it may, the crux of the game(s) for all of the players lies in the ability of one party to exert his influence over the other. In other words, the power of one party can be measured by the probability of getting a certain strategy selected by the other player. As previously noted (see Chapter V), several power dimensions may

be identified ranging from the base of the power (resources, assets, etc.) to the opportunity costs of refusing to an action. This point is especially significant in the case of American farm interests. Quite obviously the base, means, scope and extension of their power was quite limited relative to the "collective" interests of the Soviet trading agency. The same cannot be said when comparing the U. S. with Russia over credit arrangements. Power "dimensions" therefore were considerably greater for the Soviet Union when dealing with the "individual" wheat exporters.

The "amount" of power in both deals, however, depended on the difference of two probabilities. In the case of the American private exporters, it can be argued that the Soviet Union's power can be thought of in terms of increased probabilities of securing certain actions (the sale), conditioned by the costs borne by the wheat dealers for refusing to be influenced. Moreover, the "strength" of such power can be phrased in terms of utility lost to the exporters if they had refused to make the sale (in this case lost revenue of over 1 billion dollars). This in turn can be related to the exporters' disutility in performing the sale. In this situation the disutility was "perceived" as market prices rose and dealers lamented "what could have been." However, at the

time of the sale such disutility was nearly zero.²⁴ In algebraic terms, following the Zeuthen-Nash-Harsanyi model of Chapter V, p can be the increase in probabilities or amount of Russia's power, u the utility gain to the exporters for acceding to the Russians, and x the disutility to the wheat dealers for accepting the sale or $\Delta p \leq \frac{u}{x}$. That is, the Soviet Union's power maximum was simply the ratio of the exporters' gained utility to their disutility from agreeing to the sale. Under the described conditions, it therefore appears that the exporters had little to lose, much to gain, and the Soviets had correspondingly greater power in its bargaining position.

In the case of the Soviet Union and the U. S. government, such an assumed power position is somewhat more complex. That is, both parties had power over each other.²⁵

In reality, a "true" bilateral power situation prevailed in the agreement to trade and in the arrangements over credit. Under such conditions, there existed the possibility of mixed strategies, rewards, sanctions and retaliatory actions.

²⁴Disutility could have arisen if the wheat could have been sold in other markets at more favorable prices. However, this was highly unlikely during the period of the sale.

²⁵In the case of the U.S. exporters being motivated by profit, it was assumed that the only power they had was to refuse to sell--a highly unlikely assumption. As price was set by previously described forces, much out of the hands of the exporters, this was not considered a relative power force either.

More specifically, it was possible for both nations to use mixed strategies--or change their strategies in some chance fashion to insure a more favorable payoff. In addition, rewards could have been offered for the performance of an act. As noted, at the time of the deal, negotiations were taking place over shipping problems, lend lease debt and Viet Nam. Additional possible rewards could have included future markets, much needed sources of supplies of certain critical items (for example--in the case of the U. S.-oil), or political concessions. Along similar lines, sanctions and retaliatory actions could have included the loss or reduction of such benefits.

In terms of the previously presented game theory model, and if the previous assumptions are accepted, the amount of Russia's power over the United States would be equal to one-half the difference between: the rewards plus the penalties given the U. S. by Russia, divided by the disutility to the U. S. for agreeing to the sale; minus--- the cost to the Soviet Union for imposing any damages, minus the cost of any rewards given to the U. S., divided by the gain in utility to Russia if the U. S. performs with absolute certainty. The greater the difference between the two forces, the greater will be Soviet power.²⁶

²⁶It might be noted that the U. S. position can now be considered to be a collective one. That is, it includes not only direct gains (losses) to government but also gains (losses) to its citizens.

Symbolically the deal would appear as:

$$\frac{1}{2} \left[\frac{\text{rewards (U.S.)} + \text{Penalties (U.S.)}}{\text{disutility (U.S.)}} - \frac{\text{Penalties Costs (U.S.S.R.)} - \text{Reward Costs (U.S.S.R.)}}{\text{Utility gains for certain performance (U.S.S.R.)}} \right]^{27}$$

From the preceding analysis of the various costs and benefits (Section "The Costs and Benefits of the Deal" of this chapter) that conceivably could apply to the deal, the rewards, penalties and disutility to the U. S. "appear" to have been larger than the penalty and reward costs and utility gain (i.e., one probability utility gain) to the Soviet Union.²⁸ If such was the case, the bargaining position of the Soviet Union would have been greater and actual deal closer to Russian desires.

Unfortunately, the game theory analysis, although beneficial, suffers from a lack of concise and reliable data. This is, in part, due to the nature of the model (utility is required) and in part caused by incomplete information concerning the deal itself. The entire system has value, however, in its unique "view" of the grain deal and its ability to reveal many facets incapable of strictly economic analysis.

²⁷For instance, rough numbers for the model could appear as $\frac{1}{2} \left[\frac{4+1}{1} - \frac{(.7-.5)}{.5} \right]$. Of course, such numbers are

not available--especially any gains or costs to the Soviet Union. In addition, for a more mechanical breakdown of the workings of the model, see Chapter V.

²⁸See footnote 25 in Chapter V.

CHAPTER VII

STATE TRADING IN OIL--THE OPEC CASE

The wheat deal between the United States and the Soviet Union is a good example of the increasing role that governments are having in international trade. Still another is the subject of this chapter--the crucial role that the Organization of Petroleum Exporting Countries (OPEC) has come to play in determining world oil prices, availabilities, and to some extent, the level and distribution of world income and output.

There can be little question that, of the many economic problems facing the United States, the energy crisis stands foremost. A full production, full employment economy with reasonable price stability is simply not possible without adequate supplies of oil and petroleum products. As demonstrated by the Arab oil embargo of 1973-74, the U. S. is no longer in a position to "assume" that such supplies will be automatically forthcoming. But growing oil imports, notwithstanding Mr. Nixon's "Project Independence," continue to be a necessity. Presently, the United States produces approximately 76% of its petroleum needs domestically. (These data reflect pre-embargo

conditions.) By 1980, according to an Oil Import Control authority, oil consumption will total 18 million barrels a day, of which 10 million will be from domestic sources. As a result, nearly half of American oil needs will have to be met by imports. And these imports must come primarily from areas of known oil reserves, i. e., the Middle East.¹ A study of U. S. petroleum sources is therefore to a very considerable extent, a study of the OPEC--THE state trader of oil.²

The OPEC--Its Origin and Development

The history of the OPEC is, in a large part, the recent history of the Middle East. That is, many of the factors that affected the development of Middle Eastern countries also influenced (both favorably and unfavorably), the OPEC. A complete history of the area would be too immense for this paper's purposes, due to the mass and complexity of political, economic, and religious factors involved. Hence, although all of these influences are important, only those of a "critical" nature to OPEC are considered below.

¹United States Congress, U. S. Interests in and Policy Toward the Persian Gulf, Hearings before the Subcommittee on the Near East of the Committee on Foreign Affairs, House of Representatives, 92nd Congress, Second Session, February 2, June 7, August 8 and 15, 1972 (Washington, D.C.: Government Printing Office, 1972), p. 140.

²The term "state trader" applies to OPEC as all oil is owned by each respective state.

The Organization of Petroleum Exporting Nations had its "official" beginning in Baghdad in September, 1960.³ However, its seeds had been planted many years earlier in various arrangements and agreements created by major oil producing companies. And just as labor unions found strength through collective action, the OPEC nations sought similar power by banding together.⁴ Venezuela has been credited with the initial role because of its early contacts (1948-49) with "Eastern" oil exporters. However, it was not until 1959, at the first Arabian Congress in Cairo, that oil became an acceptable topic on the agenda of the Congress. Basically, the exporting countries were seeking a common policy or attitude toward the united front of petroleum companies. Although no positive action was taken in the initial meetings, all members of the "to be" OPEC were brought together, notwithstanding their diverse backgrounds. Included were Iran, Iraq, Kuwait, Saudi Arabia, and Venezuela.⁵

At this point it might be beneficial to examine briefly the oil-purchasing companies and their role in the

³John Maffre, "Administration Searching for Methods to Aid U. S. Oil Interests in Bargaining With OPEC," National Journal, IV (May 13, 1972), 810.

⁴Collective strength (or countervailing power) is, of course, only one of many possible reasons for the development of labor unions.

⁵Charles A. Heller, "Ten Years of OPEC," World Petroleum, XVI (November, 1970), 46.

creation of the OPEC. Basically, seven major oil producers (referred to as the "Seven Sisters") had been investing for many years in the Middle East.⁶ Due to many price wars, however, these companies had reached agreement (as early as 1929) on an elaborate system of quotas and posted prices. This system remained in force through World War II but began to show signs of cracking under the rising tide of nationalism in the early 1950's. By the late fifties, a market generally characterized by excess demand for oil products had created a new rivalry between these producers and some new independent manufacturers. The producing countries, however, many with their income primarily dependent on oil royalties, began to sense the possibility of losing revenues. This suspicion was confirmed in 1960 when the "Seven Sisters" announced--without consulting the oil producing countries--a price reduction of 2 to 5.5 per cent. As a result, the Middle Eastern countries lost, in 1960 alone, \$93 million in royalties.⁷

Thus the stage was set--the final provocative act had been committed. The resulting coalition of the five charter members of OPEC took place within 30 days after the price reduction. Although other events such as the Suez

⁶The companies were: Standard Oil Company of New Jersey, Royal Dutch, Shell Group, Mobil Oil Corporation, Gulf Oil, Standard Oil of California, and British Petroleum.

⁷Maffre, loc. cit., pp. 810-812.

Canal crisis in 1957-58, growing nationalistic feelings, and so forth also conditioned the OPEC's formation, the "one-sidedness" of power in the hands of the producing companies appears to have been the galvanizing force stimulating a countervailing power. Today, however, that power is anything but one-sided.

Recent OPEC Activities

From its inception, the organization was plagued by many difficulties. As previously noted, the members have power struggles among themselves.⁸ Arab unity, in particular, has been extremely fragile, since the Arab political spectrum runs from radical or revolutionary regimes such as Libya to such traditional, conservative, and stable governments as those of Saudi Arabia and Kuwait.⁹ In truth, OPEC's unity comes only from a common dependence on oil revenues--a single but cohesive force.

However, over the years the organization's power (and membership) has been steadily growing, accompanied by a firming-up of its objectives. Basically, these objectives are three-fold: (1) the achievement of price stability for petroleum in world markets; (2) increased revenue and

⁸Marwan Iskandar, "OPEC in Less Than Unanimity," World Petroleum, XLII (December, 1971), 30-31.

⁹Iran, a non-Arab country, is politically similar to Saudi Arabia.

returns to member countries; and (3) the establishment of a common oil policy toward the oil companies.¹⁰ For several years these goals were generally unfulfilled except for rather minor successes in preventing further posted price reductions and in securing slightly better tax rates on the oil producers. But in 1967 the "paper tiger" began to reveal its potential strength. As the Arab-Israeli dispute deepened, the Arab members of the organization threatened to cut off oil supplies to Western countries if any assistance was given Israel. With the coming of the "six day war," the threat was kept. However, due to available supplies from other sources and some previous customer stockpiling, the effect was small, and the embargo ended some two months later. The OPEC had flexed its muscles although they were not quite fully developed.

Out of failure, though, can come a new, "harder line" approach. Unsuccessful in cutting off supplies by embargoes, the OPEC began to focus attention on a much broader method of control--that of participation.¹¹ In a declaratory statement of petroleum policy at its sixteenth conference in June 1968, the OPEC announced as their

¹⁰Heller, op. cit., p. 50.

¹¹Michael Field, "Oil: OPEC and Participation," The World Today, January, 1972, p. 5-7.

ultimate goal "complete" control over the oil industry.¹² Furthermore, the declaration stated their view that each country had permanent sovereignty over its own natural resources. To achieve the control objective, the following principles were to apply: (1) the government would supervise foreign capital investments, (2) the government would regulate the operation of foreign contractors, (3) exploration and development of petroleum would be in government hands, (4) renewal provisions would be included in operating contracts at pre-determined dates, (5) renewal provisions would guarantee future government participation, (6) the government's assessment of the operator's income, taxes, and payments to the state would be based on negotiated agreements with consideration given to the prices of manufactured goods traded internationally, (7) excess profit earnings would be open to renegotiation, (8) there would be established in each member country a "petroleum policy" providing for training domestic workers, for participation in the setting of royalty rates, tax rates, and so forth and (9) disputes would be handled by national courts.¹³

In sum, a "New Petroleum Deal" was created in 1968 which acted as a reference base for future actions by the

¹²In the shorter run, however, the OPEC countries demanded and were granted concessions that led to the treatment of royalties as part of operating expenses along with a reduction of marketing discounts.

¹³Ibid., p. 54.

OPEC members. Quite obviously, not all of the objectives have been fulfilled, but they have served (in part, at least) as the bases for present and "new" radical demands. For instance, in 1971 in Tehran and Tripoli, 23 oil companies, including the Seven Sisters, bargained "collectively" with the (then) seven OPEC members. (Ironically, the governments of Britain, France, and the United States had granted antitrust privileges to the oil companies, allowing them to negotiate as a group. The U. S. delegation, according to a Justice Department decision, would not be breaking any antitrust laws. Like trucking companies bargaining with the Teamsters, the oil companies could thus offer a united front--and legally so.)¹⁴

During the actual negotiations, the threat of an embargo was potentially much more dangerous in 1971 than it had been earlier because of changing market conditions. The OPEC countries, taking advantage of their position, demanded \$15 billion in additional taxes from the companies (over 5 years) for the privilege of having "business as usual." Their demands were met, along with an additional \$700 million six months later following the devaluation of the dollar.¹⁵

¹⁴"Is a Cartel Next for Oilmen?" Business Week January 23, 1971, p. 46-47.

¹⁵John Maffre, op. cit., p. 811. The \$700 million was demanded to compensate for the drop in the value of the dollar . . . the basic unit of payment by the oil companies.

OPEC Participation. Added revenues are important gains, of course, but the central, dominant goal of the OPEC today remains participation. Just as labor unions first sought membership before greater economic benefits, the OPEC nations in their first ten years sought economic benefits and now are pursuing control. Participation is the question of today and tomorrow. As pointed out by Nadim Pachachi, Secretary General of OPEC:

Over the last twenty years circumstances have changed, and nowhere do governments accept the role of sleeping partner. They want to have a direct role in the management and exploration of national oil resources, so as to get knowhow, and to develop national expertise in the production and marketing of oil.¹⁶

The degree and type of participation, however, varies from country to country. Ultimately, the OPEC members would like to control outlets in consumer countries--the so-called "downstream ventures." Of course, the companies' role as middleman would then be eliminated. The benefits would presumably be substantial, but the capital costs would be extremely high--perhaps too high relative to current income. A more moderate short term goal has been the control of production "within" the host nation--the "upstream" end of the industry.

¹⁶Michael Field, "Oil: OPEC and Participation," The World Today, XVIII (January, 1972), 6-7.

Given the desire for participation--which most oil companies feel is inevitable--two types of participation are possible. First, the OPEC members might opt for equity shareholding, or secondly, the more active "joint venture" approach. The latter currently appears to be the most desired option. However, there appears to be little agreement among either the oil companies or the OPEC members regarding compensation for the investments. As pointed out in a report on an OPEC session, for example:

Three different positions emerged: Abu Dhabi, Iran, Iraq, Kuwait, Qatar and Saudi Arabia favored a 20 per cent shareholding in operating companies. Libya, supported by Algeria and following in its pattern called for either a 51 per cent participation or nationalization. Indonesia, Nigeria and Venezuela did not actively seek to support either position because of their own particular circumstances¹⁷

Similarly, the oil companies themselves have been unable to reach agreement on a common "acceptance policy" for participation. Some companies would like to hold out as long as possible, but not so long as to precipitate nationalization. Other firms, taking a somewhat more dynamic view, would prefer to anticipate the changing nature of oil agreements and perhaps secure better compensation thereby. In general, U. S. companies seem to have

¹⁷Marwan Iskandor, op. cit., p. 30.

adopted the first position, while European firms have been more willing to modify existing arrangements.¹⁸

Further complicating the matter is disagreement among all parties as to the value of compensation once the question of the form of participation has been settled. Basically, the OPEC members would prefer to use the book value of the operator's assets--including such items as plants, pipelines, etc.--at cost price minus depreciation. On the other hand, the companies want a procedure that would allow for the covering of lost anticipated profits. And the discrepancies between the two positions would appear to be enormous.

The OPEC Lesson

In the relatively short period of its existence, it is quite apparent that the OPEC has become a very formidable state trader. Moreover, its existence and development offer some useful insights into the complex nature of state trading itself, and cast light on both past trends and future possibilities.

It is quite apparent that, so far, only the "tip of the iceberg" has been revealed by OPEC activities. The U. S., like most other industrialized countries, will

¹⁸United States Congress, The United States and the Persian Gulf, Report of the Subcommittee on Foreign Affairs, House of Representatives, September 29, 1972 (Washington, D.C.: Government Printing Office, 1972), p. 4.

doubtless find itself confronted with growing demands by the OPEC members. Because of the essential and strategic nature of petroleum, the U. S.--whether willing or unwilling--will be forced to expand its relations with OPEC. As Table 5 shows, the United States controls only a small fraction of total known oil reserves. The largest source--greater than all others combined--is the Arab Middle East and North Africa. And in the short run, oil demand appears to be quite inelastic, given the paucity of available substitutes. Under these conditions, it is anything but a buyer's market. Most of the "iceberg," therefore, is the chronic need of the industrial countries for OPEC oil.

Another part of the OPEC problem is monetary. As Table 6 points out, the revenues which are expected to accrue to the Middle Eastern members of the OPEC alone are enormous. From an estimated \$6 billion in funds in 1973, the Middle East's receipts should rise to approximately \$36 billion annually by 1980. And these estimates are based on mid-1973 values for oil, not on the more recently inflated figures. As far as the U. S. balance of payments is concerned, it was estimated before the oil embargo that \$17 to \$20 billion annually would be paid for oil imports (from all sources) by 1980 and \$30 billion by 1985, and this, too, was based on mid-1973 oil prices.¹⁹

¹⁹U. S. Interests in and Policy Toward the Persian Gulf, p. 53.

TABLE 5
WORLDWIDE 'PUBLISHED PROVED' OIL RESERVES

Country	Barrels (Billions)	Share of Total %
United States	45.4	6.8
Canada	10.2	1.5
Caribbean	17.1	2.8
Other Western Hemisphere	14.5	2.3
Total Western Hemisphere	87.2	13.4
Western Europe	14.8	2.3
Africa	58.9	8.9
Middle East	366.8	57.6
U.S.S.R., East Europe and China	98.5	15.4
Other Eastern Hemisphere	15.6	2.4
Total Eastern Hemisphere	554.6	86.6
World	641.8	100.0

Source: Robert E. Hunter, The Energy Crisis and U. S. Foreign Policy, Headline Series, No. 216 (New York: Foreign Policy Association, Inc., 1973), p. 27.

TABLE 6

ESTIMATES OF MIDDLE EAST OIL PRODUCTION AND REVENUES
(Production stated in thousands of barrels per day,
and revenue in billions of dollars per year)

	1970		1975		1980	
	Annual production	Annual revenue	Annual production	Annual revenue	Annual production	Annual revenue
Middle East:						
Iran	3,848	1.1	7,300	4.3	8,900	7.9
Saudi Arabia	3,798	1.2	8,500	5.2	14,000	12.2
Kuwait	2,989	.9	3,500	2.0	4,000	3.5
Iraq	1,558	.5	1,900	1.2	3,000	2.8
Abu Dhabi	691	.2	2,300	1.4	3,500	3.1
Other Persian Gulf States	857	.3	1,800	1.0	2,000	1.8
Subtotal	13,741	4.2	25,300	15.1	35,400	31.3
North Africa:						
Libya	3,321	1.3	2,200	2.0	2,000	2.6
Algeria	900	.4	1,200	1.1	1,500	1.9
Subtotal	4,311	1.7	3,400	3.1	3,500	4.5
Total	18,952	5.9	28,700	18.2	38,900	35.8

SOURCE: United States Congress, The United States and the Persian Gulf, Report of the Subcommittee on the Near East of the Committee on Foreign Affairs, House of Representatives, September 29, 1972 (Washington, D.C.: Government Printing Office, 1972), p. 5.

The impact of this enormous revenue exchange will be critical for all concerned parties. For the United States, which presently has a favorable trade balance with the Middle East, the increase should be easier to swallow than for Western Europe and Japan, whose dependence on OPEC oil approaches 100% in some cases. Also, the U. S.'s trade balance with the OPEC countries may be helped as the development process raises their incomes and, hopefully, their future purchases from the United States. However, these improvements may seem somewhat insignificant compared to the \$10 billion (in 1980) or \$15 billion (in 1985) that oil imports from the Middle East are expected to cost.²⁰ Moreover the returns on U. S. investments (presently approximately \$1.5 billion annually) will probably decline as Middle East "interests" replace Western "interests" in the ownership of oil producing facilities.

To the Persian Gulf States, these funds must seem like manna from heaven. Though relatively underdeveloped at present, these countries can employ enormous amounts to development, raise consumption, and provide for increased social welfare benefits. But on the negative side (from the U. S. point of view), these balances will give the OPEC states unique and sudden abundance of hard foreign exchange.

²⁰The \$10 and \$15 billion figures are derived from estimates that one-half of U. S. oil will come from the Persian Gulf by 1980-85.

Much of this will be held in the form of American dollars, and thus pose a potential threat to stable exchange rates and money markets around the world. In fact, these countries could become primary sources of international investment funds, and may even become the homes of major international financial centers. (Beirut, though not in a major petroleum producing country, has already become a financial force to be reckoned with in the Middle East.) As this occurs, the U. S. may expect new impacts upon its balance of payments, its monetary policy, its aid policy, and its general bargaining position in the world.

In light of the above features, it is now possible to cast the bargaining positions (game theory) of the OPEC and the purchasing companies. First, it is necessary to know something about the players. Actually, their makeup and characteristics have been changing and appear to still be seeking permanent forms. Originally, for example, the OPEC numbered five but has grown to eleven over the years through a method which allows degrees of membership. The degrees range from full charter membership to "new" full membership to "associate" membership.²¹ Under this arrangement, the OPEC may expand and allow other countries to join the organization (by degree) and thereby increase the

²¹ Ruad Rouhau, A History of OPEC, (New York: Praeger Publishers, 1971), p. 7.

effective collective strength of the group. In fact, potential members need not be substantial exporters of oil, but only share the same common interests and beliefs of the OPEC nations. Similarly, the oil companies themselves have been taking on various changing forms. In the original negotiations with OPEC, the companies bargained somewhat independently, but as noted earlier, they have been allowed by their respective national governments to combine their forces into one united front. It can therefore, be argued that the producers are in effect one buyer. Given the one seller--the OPEC--and one buying oil company group, a reasonable approximation of bilateral monopoly can be said to exist. In this situation, a state trader (the OPEC) confronts a private trading bloc (the oil companies).²² It is interesting to note, however, that these conditions are not necessarily permanent, since additional assistance may be given either side if conditions warrant such interference. For example, U. S. government intervention may take place on behalf of American oil interests in the case of possible nationalization. Or the OPEC countries could

²²It must be pointed out that the term "private trading bloc" is more applicable to U. S. interests than that of all companies. U. S. firms are private organizations but not all importing organizations are. In addition, the United States is one of the few that recognizes private ownership of petroleum (or mineral rights). Most governments claim ownership of oil beneath the ground.

conceivably ask for Russian assistance if armed intervention on the part of Western powers appeared likely.

As to the actual bargaining itself, Herbert Hansen, Vice President for government agreements of Gulf Oil Corporation, perhaps best summarizes the problem:

Negotiating with OPEC can be a mysterious process which has been likened to the mating of elephants. Everything takes place at a very high level, in clouds of dust, and it is several years before you can see the results.²³

In other words, OPEC negotiations, like many other state trading arrangements, are subject to a high degree of vagueness and secrecy. As in the case of the Soviet wheat deal, much is still unknown (or unavailable) concerning the arrangements. However, a game theory approach can be helpful in isolating some variables relevant to the negotiations.

First, it may be recalled that each player may select various strategies, depending on his interpretation of the events. For each party, each strategy has its own unique value or worth (utility). The actual payoff, of course, depends on the opposing strategy employed by the other player. For example, the OPEC nations may employ a particular strategy while the oil companies do likewise. The payoff from these two strategies (whether zero-sum or

²³U. S. Interests in and Policy Toward the Persian Gulf, Hearings, op. cit., p. 37.

non-zero sum) depends partly on chance or luck, and partly on the respective power position of the traders. This much has been previously stated. But what are some of the possible "elements" within each party's strategies?

On the side of the OPEC, the group's overall strategies are very much affected by the very disparity in the sub-goals of the different members which were referred to earlier. The formal objectives of the OPEC are generally accepted by all members, of course, but the degree of importance attached to each goal doubtless varies for each country. Hence, the overall OPEC stance will depend in part on which political (or economic) faction dominates the organization.

In the earlier years of the OPEC, a fairly mild attitude prevailed with the elements of its strategies consisting mainly of increased royalties and maintenance of posted prices. As the organization developed both in numbers and potential power, its desires became more extreme. Assuming that the more radical "factions" (like Libya and Algeria) dominate, the elements within their strategies would probably consist of much higher royalty rates, increased nationalization efforts, greater downstream participation, higher crude prices, and greater political use of oil "power." Elements within other strategies would be similar but perhaps lesser in degree--

for example, a 20% participation rate rather than nationalization.²⁴

Recent events tend to indicate that the more extreme position is in fact coming to dominate the policies of the OPEC. During the recent renewal of fighting between Israel and several Arab countries, for example, the threat of an oil embargo against the U. S. for supporting Israel was made and carried out. In addition, Libya nationalized the holdings of two U. S. oil companies on the grounds of "Israeli aggression." More directly, the OPEC itself, had actually taken unilateral action in doubling posted prices twice. These actions were taken even though the 1971 Tehran agreement was supposed to last 5 years!

With the above influencing factors present, and with use of the previously described game theory model, the OPEC nations' power derives from its ability to secure desired action from the oil companies. The rewards to the oil companies basically take the form of continued supplies of crude oil at negotiated prices. Additional rewards could stem from better relationships with Middle Eastern countries (precluding or diminishing the need for greater dependence on Russia or for finding added oil elsewhere)

²⁴The elements within the oil buyers' strategies would also vary in degree, depending on the "weighted" influences and desires of the concerned companies. As previously noted, the U. S. has taken a firmer stance than European interests on such issues as nationalization, participation, prices, etc.

and from participation rather than nationalization of company oil interests. The cost of these "rewards" to the OPEC can be measured by the difference between whatever revenues are secured from a mutual agreement and those financial gains which could be had from a stronger degree of participation and/or nationalization.

The penalties to the companies similarly, could include and OPEC refusal to supply oil, worsened relationships, and/or complete nationalization. In degree, all of these have already been imposed against the oil companies. In the last major negotiation arranged in Tehran and Tripoli in 1971, the five year agreement was reached after the threat of an embargo. This penalty move cost the companies some \$15 billion in revenue over the life of the contract. Nationalization also has been used as a penalty, but for somewhat different reasons. In addition to the aforementioned October, 1973 takeover, Col. Muammar Raddafi of Libya had earlier on June 11, 1973, nationalized the Hunt Oil Company in what was termed a prelude to a widespread showdown.²⁵ The takeover in this case was not a direct OPEC act, but the state and OPEC for most practical purposes are inseparable. Libya, along with other Arab countries, was pressing for further participation at the

²⁵"Slap in the Face by Libya--Why," U. S. News and World Report, June 25, 1973, p. 72.

time. In addition, the penalty was imposed directly against American oil interests in retaliation for American support of Israel.

On the buying side, the oil companies have also taken on changing forms. Their obtaining of official governmental approval for cartel behavior certainly served to increase their power position. Also, the companies can count to some extent on "backlash" against the OPEC by non-OPEC countries. The 1973-74 embargo, for example, seems to have hurt fuel-using underdeveloped countries more than it has the developed countries. The world-wide price rise for petroleum has also boosted oil company profits, stimulated more oil production by non-members and added exploration outside OPEC territories, and set energy users to exploring other sources of power, particularly coal. These, over the long run, clearly strengthen the companies' bargaining position.

However, due to the (shortrun) crucial nature of petroleum products, it is not too likely that the oil companies (and the consuming countries they serve) will be able to impose any real sanctions against the OPEC nations. These sanctions might include the refusal to buy oil, attempting to lower posted prices or reduced royalties and taxes, or the reduction of trade and aid; but none seem feasible in the face of growing world oil needs and the

OPEC's swiftly improving financial position. The aforementioned sanctions against the oil companies (embargoes, higher prices, and so forth) therefore appear to be more likely to prevail in practice.

Giving consideration to the various rewards and penalties, then, the amount of OPEC's power over the oil companies would be equal to one-half the difference between: the rewards plus the penalties given the oil companies by OPEC, divided by the disutility to the oil companies for agreeing to the OPEC's terms; minus . . . the cost to the OPEC for imposing any damages, minus the cost of any rewards given to the oil companies, divided by the gain in utility to the OPEC if the companies perform with absolute certainty. The greater the difference between the two forces, the greater will be the OPEC's power. Symbolically, the deal would appear as:

$$\frac{1}{2} \left[\frac{\text{Rewards (companies)} + \text{Penalties (companies)}}{\text{Disutility (companies)}} - \frac{\text{Penalties Costs (OPEC)} - \text{Reward Costs (OPEC)}}{\text{Utility gains for certain performances (OPEC)}} \right].$$

Under the described conditions, the rewards, penalties, and disutility to the oil companies (and the concerned nations) appear to be larger than the penalty and reward costs and utility gain to the OPEC. If this is

correct, the bargaining strength and position of OPEC would be greater than that of the oil companies.²⁶

Given this disadvantageous power position for the oil companies and the consuming interests they represent, some have given consideration to the development of a new countervailing power--OPIC. An Organization of Petroleum Importing Countries has been proposed as a possible equalizing factor to offset OPEC's position. In fact, this step was partially taken when the Justice Department allowed "cartel" bargaining by American firms. It may be noted, however, that the domestic interests of American companies are basically similar, so this step was a relatively easy one. But the needs and desires of European oil companies are far from being "basically similar" to those of their American counterparts. In light of Europe's dependence on Middle Eastern oil, it seems highly unlikely that in the near future such an international OPIC alliance would be possible. This, coupled with official European "neutrality" in the Israeli-Arab conflict, appears to leave the OPEC relatively unchallenged.

The OPEC case thus helps to point out the crucial nature and significance of state trading. Quite obviously,

²⁶In this situation, the power for the seller appears to be greater. In the Soviet wheat deal, greater power appeared to have been in the hands of the purchaser. Also see footnote 25, Chapter V.

the commodity in question (petroleum) is very essential; other goods exchanged by state traders are not always as important. However, that in itself suggests that the potentials of government commerce are virtually boundless. Practically any good (or service) can be state traded. Failure to recognize this may put the United States (or any country) in an undesirable position with respect to foreign and domestic policy. The OPEC lesson is clear; state trading can offer both advantages and disadvantages to the world. Either way, it gives every appearance of fostering a true revolution in world trade and investment.

CHAPTER VIII

SUMMARY AND CONCLUSION

As noted at the beginning, the purpose of this study has been to explore and analytically examine the economic and non-economic nature of governmental trade. The need for such a study has become apparent. Although information has been available concerning certain aspects of state trading, little has been done in analyzing the economic purpose, significance, and "indeterminacy" of such exchange. In addition, "game theory" has not been previously applied to the unique situations found within government commerce.

As a result of this inquiry, some new insights into the state trading process have hopefully been developed. Briefly, government trading was defined as international commerce between national governments or their agents. Although state trading dates back at least as far as the Middle Ages, it was sporadic and poorly developed in that period. However, as market economies appeared, new avenues of expansion were made available. Especially in the Mercantile period, governments grew in statute and power, with state trading flourishing with the successes

of the trading monopolies created by many European governments.

Ironically, although economic liberalism ushered in the Industrial Revolution and eventually socialism and "total" state trading in some parts of the world, its atmosphere of "free thinking" first led in the direction of laissez faire. Especially in the Classical period, there was increased pressure for change in the direction of a "hands off" policy of limited regulation and control. The concept of "self interest and the public good" reduced the need for government intervention, creating a climate in which state trading stagnated and all but disappeared.

It thus appears that one of the first characteristics of state trading was its fluctuating pattern. This trait, once established, has never ceased. As further evidence, after the Classical era, governmental commerce was again rekindled under the aegis of Socialism. Socialistic writings generally advocated that economies be "planned" rather than market-oriented. Of course, the role of the state in all affairs was more extensive under socialism than under previous economic systems.

By the turn of the twentieth century, countries such as the United States, France, and Russia had established world-wide government trading missions. These beginnings, although sporadic and piecemeal, grew and became more permanent with the need for strategic supplies

during World War I. However, after the War, the U. S. returned its emphasis to more private channels of exchange, while Russia, France, and some Far East nations continued to develop and expand their methods of government commerce. By the decade of the thirties, the Soviet Union offered such a strong example that many nations, facing growing trade barriers abroad and unemployment at home, eagerly adopted state trading practices to ease their difficulties. And with the 1939 outbreak of hostilities in Europe, new trade alignments were made (including trade agreements between Russia and the United States). These practices were broadened and continued into the late forties.

In more recent years the spread of state trading has continued. During the 1950's, France and Britain, along with many Far Eastern countries, negotiated government contracts for the securing of essential agricultural commodities. Similarly, the Soviet Union continued to expand its form of government trade while extending its influence into the bordering nations of Eastern Europe with the "adoption" of satellite countries.

Ironically, during this same period the United States again reversed its generally market-oriented policy and laid the foundation for the resurgent development of its own special brand of state trading. With the enactment of Public Law 480, today's Food-for-Peace program, the

disposal of government-owned agricultural surpluses accelerated. In addition, the program has become a tool for: (1) the encouragement of economic development abroad, (2) the expansion of American markets, and (3) more general U. S. foreign policy goals. However, in the early seventies the volume exchanged under the program declined slightly, although recent grain and oil contracts (1972-73) with the Soviet Union and China indicate renewed interest for expansion in these areas. From peak to trough, the cyclical pattern appears to be firmly established.

The goals and consequences of state trading, like the history of government exchange, have also been subject to variation in light of the conditions of the times. There has been a myriad of motivating forces for government trading. In some instances single goals have been subrogated to multiple combinations or blends. They include the following, either singularly or in combination: (1) securing regular flows of goods at favorable or stable prices, (2) maintenance of stable production, (3) disposition of surplus commodities, (4) ensurance of adequate supplies via bulk purchase contracts, (5) assistance to government aid and development programs, (6) raising revenues, (7) regulation of health and sanitary conditions, (8) securing of barter deals, (9) rationing of foreign exchange, (10) the

practicing of price discrimination, and (11) the facilitation of trade with centrally planned economies.

Though the motivations may be quite specific, the broad economic consequences of state trading are most usefully grouped according to whether the goods are traded below, at, or above market prices. In the case of commodities sold above domestic prices the effect is basically the same as a tax on exports under a regime of private trade. Foreign consumption tends to be restricted, while import-competing industries are stimulated. Similarly, domestic consumption in the selling nation may be stimulated by increased local supplies resulting from lost overseas markets. Overall, domestic production may be reduced, since efficient production is displaced by less efficient.

Under certain conditions it may also appear desirable to the state trader to import commodities below foreign prices. In this case the effects are similar to that of a tariff on imports equal to the difference between foreign and domestic prices. If the reduced imports increase supplies abroad (as seems likely), foreign consumption would likely be increased and foreign production restricted. Similarly, domestic consumption would be reduced, assuming prices rise with reduced supplies of the imported good. This in turn may stimulate domestic production in import-competing industries. In addition,

as in the previous case, the "terms of trade" effect depends on the bargaining strengths of the respective nations. That is, the attempted buying of imports below domestic prices may induce the exporting nation to sell at lower prices to maintain sales and revenue. If the state trader is large and is a dominant buyer of the commodity in question, the exporting country's terms of trade can worsen. Conversely, the government trader's terms may improve.

In some situations the state trader may take the position of an exporter selling commodities below domestic price levels. The economic effects are similar to those of subsidies in private trade with the degree of impact being determined by the divergence between world and domestic prices. Overtrading could result, rather than the previous case of undertrading. That is, increased domestic production and increased foreign consumption can take place while decreased foreign production and restricted domestic consumption can occur.

As a last alternative the state trader occasionally may import goods above world market prices. The effect is again similar to that of a subsidy to private trade (but to a foreign producer) with similar production and consumption distortions. In sum, the effects are: (1) decreased foreign consumption; (2) decreased domestic production in

import-competing industries; (3) increased domestic consumption; and (4) increased foreign production.

In total, the alternatives clearly demonstrate the ability of the state trader to influence not only the conditions of its own exchange but also international prices, market conditions, and resource usages. Of course, the selection of one alternative over another depends on the motives and objectives of the traders. Additionally, price discrimination becomes a distinct possibility. It may arise because of increased monetary profits stemming from different demand conditions or because other non-economic objectives may be sought which result in price discrimination (for economic gain or even possible loss).

Over the longer run, such pricing policies may either induce or hinder movement of factors of production. The normally assumed tendency of factor prices to equalize between trading nations can be severely dampened, or may be hastened. Moreover, when trade occurs between market and non-market nations (or non-market to non-market), price variations do not necessarily induce changes in factor use or factor prices in the non-market countries. In such countries, the use of factors (and their prices) is usually determined by the priorities of national plans rather than by market conditions.

The analysis of these trading practices and the consequences thereof made it evident that traditional

theories based on comparative costs were insufficient for explaining which goods would be exchanged and at what price (or terms of trade) under state trading. As pointed out earlier, government trade developed from a variety of motives, and the comparative cost doctrine is simply not broad enough to explain all possible cases.

Basically, comparative cost theories have been attempts to explain the behavior of market-oriented economies. Under free trade conditions, each country tends to specialize in the production of those commodities whose production costs are relatively lower and import those items in which domestic producers have a comparative cost disadvantage. The motive behind trade is one of profit (with some possible restraints). However, as noted many times, state trading may be motivated by considerations other than economic. Moreover, even if trade is conducted for strictly economic purposes, the direction and pattern of exchange may be completely opposite to what comparative costs would dictate. For example, in the non-market case so amply portrayed by the Soviet Union (and other communist bloc nations) trade has followed directions that in many instances have not been according to comparative advantage. In these countries much of their trade has been viewed as a political and "plan fulfilling" phenomenon.

Similarly, market economies that practice state trading do not necessarily follow commercial principles of

exchange. This situation is typical of many South American, African, and Far Eastern nations. Being relatively underdeveloped, they have turned to trade in order to achieve more sophistication in their economies and to foster industries that would not ordinarily appear without intervention. This interference has been in the form of subsidies to the industries to be prompted, or in the form of (or coupled with) state-trading practices.

However, perhaps of greater significance was the realization that many advanced countries also state trade along lines not necessarily consistent with comparative advantage. The U. S., for instance, promotes the production of agricultural commodities through its various assistance programs to farmers. Surpluses have often resulted which have been purchased by the government and later sold internationally. The essential fact, of course, is that the government trader has indirectly encouraged domestic production which may or may not be in line with the long-term comparative advantage of the United States.

More generally, the state trader may alter supplies by creating conditions which induce or hinder the creation of traded goods. Without reviewing all the presented cases, it was noted that domestic production was stimulated when overtrading was practiced and hindered with undertrading. Conversely, the reverse was true for the trading partners.

It is, therefore, possible that production may be directed to areas which may not reflect relative efficiency or productive competence.

On the demand side, traditional theories were also found less than fully capable of explaining the prices, direction, and volume of state trade. Demand, reflected by offer curves, may be expressed in terms of the willingness of one nation to exchange a certain bundle of goods against the export bundle of another country. If the curves are constructed so as to incorporate political as well as economic preferences, the outer limits to trade (price lines) could reveal an enlarged bargaining zone subject to influence by the economic and political power of the concerned parties. It is, therefore, evident that the state trader does not necessarily conform to trading patterns traditionally explained by comparative cost doctrines. This is especially true within non-market countries and in market economies where non-economic considerations dominate exchange policies. Even when traditional theory is modified, it is not completely satisfactory for all the possible situations that can arise. Under either barter conditions or the more normal money-based transactions, various limits are established wherein exchange can occur. However, the power positions of the respective nations can dominate the outcome, overwhelming economic considerations.

State trading, therefore, does not always lead to nice, neat, determinate solutions. Prices (the terms of trade) and the direction of traded commodities may not be able to be rationalized by traditional theory. Past work by Edgeworth and others has provided possible solutions to the bilateral monopoly problem. However, these approaches are fraught with many difficulties. The game theory approach of Von Neumann and Morgenstern introduced in the early 1940's proved more beneficial.

Game theory utilizes formal models in the analysis of decision making within the realm of conflict. It generally deals with problems involving opposition between one or more parties, with cooperation also possible. The motivation for participation may be economic, political, psychological, or any other force behind human endeavors--including those found within state trading.

In those cases analyzed within this study, however, certain restrictions or assumptions were made. Of course, this is true of all models where pre-set rules are required. In the presented case of a zero sum game, each side was assigned a value for each possible move or strategy. The exporter and importer then had to choose a strategy which ensured that over the length of the game, each player's losses would be confined to a minimum. Two possibilities were discussed, games with saddle points and

those without saddle points. In both situations probability played a decisive role. Probabilities, however, are partially determined by relative power positions.

In considering the impact of power in state trading, several dimensions were identified. These included:

(1) the base of power, (2) the means of power, (3) the scope of power, (4) the opportunity cost of power to both players, (5) and the most critical--the amount of power. In total, player A had greater power over B when A's costs to force compliance were smaller and when B's disutility for refusing were larger. It was noted that these costs could be expressed in physical units, monetary units, or abstract utility measurements. A's power over B thus included not only the ability of A to secure desired action from B with a certain probability, but also within a certain cost to A.

In total, the maximum amount of power that player A had over B was equal to the strength that A had over B divided by B's disutility of performing an action. Realistically speaking, however, such a measure required theoretical probabilities: in state trading, it was noted that nation B's behavior might be observed over a series of similar events in which B complied with A in some proportion of the times. Probability in this sense became empirical frequencies. B's behavior yielded disutility of

various amounts in the observed events. B, therefore, complied with A in those cases when the disutility was smallest.

As an illustration of the described situation, including those elements of costs, probability, and power, the Zeuthen-Nash-Harsanyi model was utilized and modified. In this model of bilateral power, both traders' functions were analyzed. That is, both state traders' power functions were viewed simultaneously.

Symbolically, when consideration was given to all possibilities--including retaliatory strategies--B selected a strategy $s(p_2)$, the equilibrium probability, which allowed the amount of A's power over B to be $\Delta p = p_2 - p_1$ (the difference in two probabilities). When A and B agree from this to do act Y with the probability p_2 then B's non-performance for act Y assumed the probability of $1 - p_2$. Technically speaking, A and B agreed on a jointly randomized mixed strategy with a probability p_2 for B and $1 - p_2$ probability of non-compliance for A. As noted by Harsanyi:

. . . A's power over B with respect to action . . . tends to be equal to half the net strength of A's power over B with respect to the same action . . . this net strength being defined as the difference between the gross relative strength of A's power over B . . . and the gross relative strength of B's power over A with respect to the complementary action¹

¹See page 121, Chapter V.

With respect to state trading the described system yielded multiple results. First, it provided an equilibrium probability for action in the example considered. In addition, the solution was Pareto Optimum, for neither state trader could increase its utility without harming the other trader. Thirdly, retaliatory strategies could be and were included for the more normal case of conflict between parties.

In addition, when the system was carried into matrix squares and modified with an additional marginal cost-marginal benefit analysis a more descriptive and complete matrix was found. At this point, the complementary nature of each method became apparent. That is, (1) the minimax-maximin solution (or the more complex mixed strategy approach), (2) the equilibrium solution of Zeuthen, Nash, and Harsanyi, and (3) method III's cost-benefit analysis--all revealed useful and complementary and new insights into the state trading process. Finally, the game theory model proved capable of application to the American wheat deal with the Soviet Union and in the OPEC oil case.

In general, then, the study has served to point up a number of previously neglected aspects of state trading. First, the investigation has suggested that governmental exchange is subject to somewhat of a fluctuating pattern.

Secondly, the notion of comparative costs was found to be insufficient when applied to most state trading cases. This was especially true when non-economic considerations motivated trade. Thirdly, it was shown to be analytically possible (as in the case of wheat and oil) to apply various game theory methods to the state trading phenomenon, and glean important insights in the process.

As a result of these findings, it is possible to form several conclusions about the nature, relevance, and impact of government exchange. Specifically, government trade varying as economic and political conditions change will give policy makers, "planning for" government commerce and its consequences, many difficulties. That is, given its cyclical pattern, it will be possible to under (or over) estimate its magnitude in some future time period. Moreover, errors are even possible in estimating its present volume given current recording practices.

To illustrate this problem, as may be recalled there is room for possible disagreement as to exactly what state trading is and what it is not. Perhaps an example would be helpful. In the wheat deal, two forms of state trading were employed. One involved the credit arrangements provided to the Soviet Union by the Commodity Credit Corporation. Credit in many instances, however, is not viewed as a commodity per se. If the arrangements are

viewed this way, the deal would not be classified as state trading. Taking an alternative view that money (credit) can be treated as a commodity, state trading was practiced. Of course, the significance lies in the possible under- (or over) statement of the magnitude of government commerce and hence the need for consistent recording practices.

Hand in hand with the recording practice difficulties, there also exists a data problem for the game theory model itself. As was revealed certain information about the players was required. Of course, much of it was subject to interpretation in this study, because the necessary data were often unknown, unpublished, or unavailable. Perhaps the accounting or recording methods of governments should be modified to further illuminate their transactions so that a more "quantitative" analysis can be made. As things are, the analysis had to be, as with much of economics, descriptive. It is capable of interpretation by economists, and policy suggestions can derive from it, but its usefulness is still limited by the data available for the model. Its value lies primarily in the insights it offers into the nature of power, the penalties, rewards, strategies, and so forth which heretofore had not been applied to state trading.

It follows from the above, that if difficulties exist in the data, there may exist difficulties in

assessing the importance of state trading. However, it has been seen that the planned economies of the world (with more than half the world's population) for the most part are complete government traders. The United States, along with many European, African, South American and Far Eastern nations practice some degree of their own special brands of governmental exchange. Moreover, the influence and impact of even relatively small state traders can be extremely significant. The OPEC case and the present oil embargo is ample evidence in itself. It might even be said that government commerce (or lack of it) is capable of influencing national boundaries: the final international boundaries between Israel and its neighbors will surely be influenced by the oil policies and oil "pressures" applied by OPEC. The growing volume of "OPECO dollars" will also have an important impact on the monetary, fiscal, and investment policies of many countries. The International Monetary Fund is presently having to reconsider its plans for future world monetary arrangements in light of much higher oil prices and their impact on payment balances for the nations of the world. The examples are virtually endless.

As for the future importance of government commerce (and of special significance to the United States), recent events have made it quite obvious that renewed interest is

again developing in the state trading process. As the world becomes more competitive, especially between trading blocs, it is apparent that government exchange will play a larger and larger role. In many areas and with many commodities there is a growing division of interests (both political and economic) between those nations having the goods for exchange and those seeking such items. As in the cases of wheat and crude oil, the nations of the world are finding themselves more dependent upon foreign sources. If such conditions continue to prevail, the United States may paradoxically find itself increasing its state trading practices while professing freer trade to the world. Even now, in the early 1970's, the U. S. is pressing for reduced discrimination in order to increase the competitiveness of its goods in foreign markets. These efforts will surely continue when consideration is given to this nation's enormous and continuing payments deficit and the growing production capabilities of other nations.

Thus, one of the many unanswered questions concerning the future of state trading will be the role of the United States. As was noted, government trade can be used as a policy vehicle for assistance purposes or it may be used against countries. The latter aspect, as evidenced by the activities of the OPEC, can be of crucial significance to the practicing nations and its trading partners.

Benefits (or costs) may be political, military, and/or economic. Usually, they (benefits and costs) are some combination of the three possibilities for it is rare, if not impossible, for a nation to limit its actions to those of a strictly economic nature.

As for the United States, it may find itself compelled to use those means at its disposal to maintain and/or increase its influence in the world. However, as noted at the beginning of this study:

When governments are also conductors of economic enterprise in the international field, what results is a pattern or intergovernmental relationship in which economic, political, and military bilateral monopoly plus duopoly are all wrapped up in one package of international dynamite.²

The conclusion is obvious. If the U. S. or any other nation(s) continues to use and/or expand their state trading practices, much more attention should be given to further inquiry and analysis of government exchange. It is puzzling--indeed, almost paradoxical--that so very little in the profession literature is devoted to this area. Only through continued research can more of the causes, consequences, and theoretical explanations be found--which hopefully, will enlighten governments to the enormous

²Viner, loc. cit.

impact of their dealings and perhaps in time temper their actions toward "commercial" standards of exchange.

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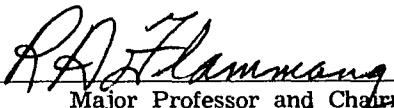
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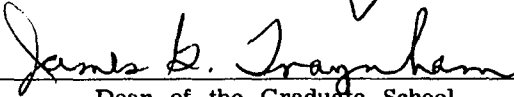
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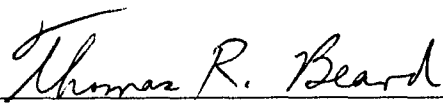
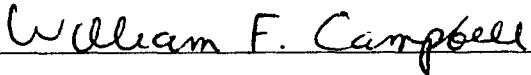
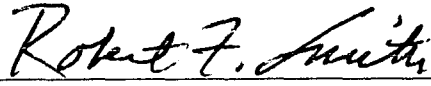
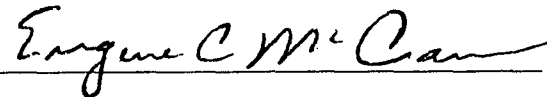
Title of Thesis: An Economic Analysis of Government Exchange

Approved:


Major Professor and Chairman


Dean of the Graduate School

EXAMINING COMMITTEE:

Date of Examination:

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